Florida WILDLIFE

Sole Music For Sportsmen
They Live By Their Teeth

Fishing · Hunting · Conservation · Outdoor Recreation

JULY 1970

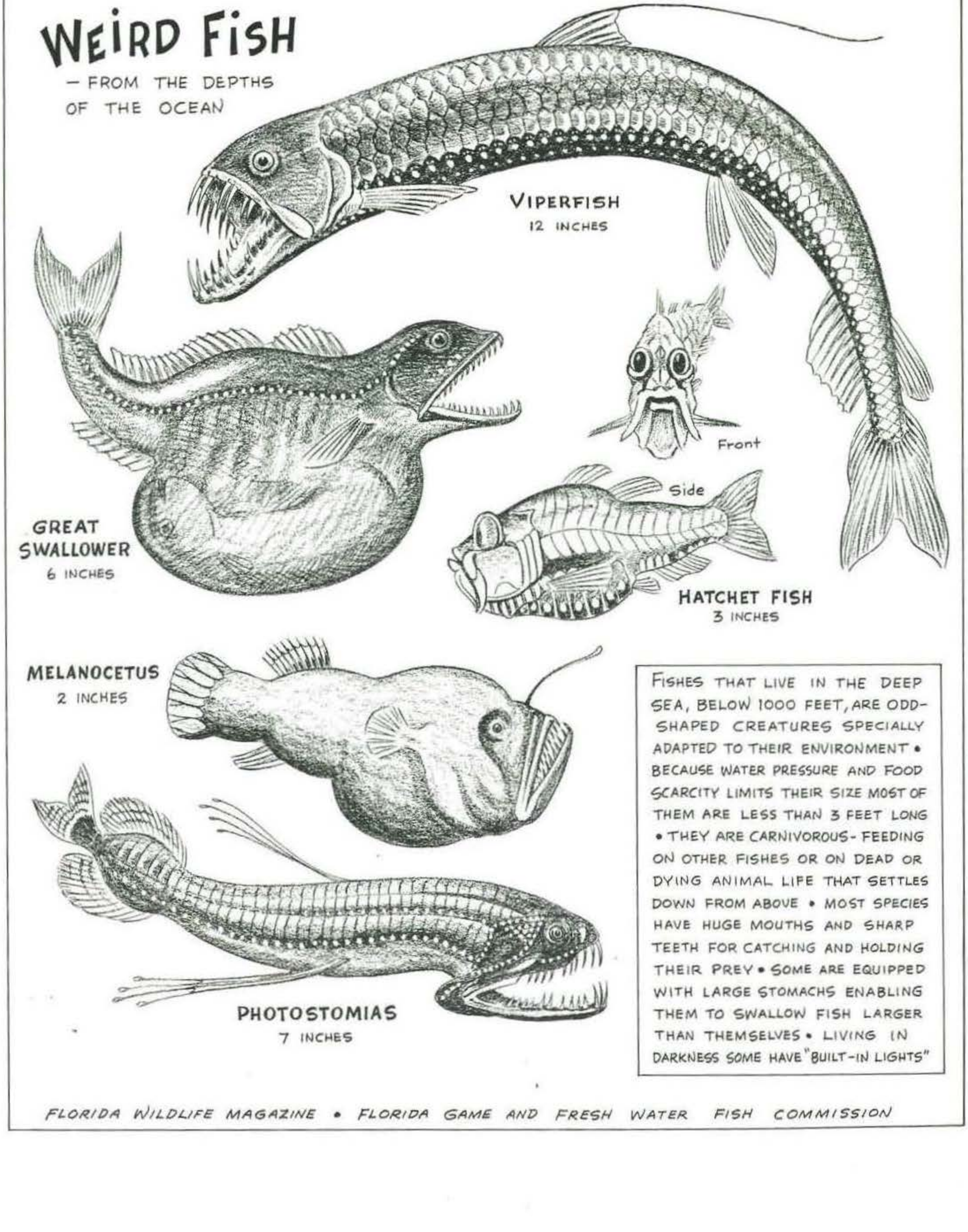
The Florida Magazine for all Sportsmen

25 CENTS

Florida Wildlife Scrapbook

WEIRD FISH

— FROM THE DEPTHS OF THE OCEAN



FISHES THAT LIVE IN THE DEEP SEA, BELOW 1000 FEET, ARE ODD-SHAPED CREATURES SPECIALLY ADAPTED TO THEIR ENVIRONMENT • BECAUSE WATER PRESSURE AND FOOD SCARCITY LIMITS THEIR SIZE MOST OF THEM ARE LESS THAN 3 FEET LONG • THEY ARE CARNIVOROUS - FEEDING ON OTHER FISHES OR ON DEAD OR DYING ANIMAL LIFE THAT SETTLES DOWN FROM ABOVE • MOST SPECIES HAVE HUGE MOUTHS AND SHARP TEETH FOR CATCHING AND HOLDING THEIR PREY • SOME ARE EQUIPPED WITH LARGE STOMACHS ENABLING THEM TO SWALLOW FISH LARGER THAN THEMSELVES • LIVING IN DARKNESS SOME HAVE "BUILT-IN LIGHTS"

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Publications Department
BILL HANSEN *Editor*
WALLACE HUGHES *Art Director*
GENE SMITH *Editorial Assistant*
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The Cover

Probably the most widely used live bait by big bass seekers, the Golden Shiner is a colorful, fast-moving native minnow that will reach a length of 12-or-more inches. See page 13.

From A Painting By Wallace Hughes

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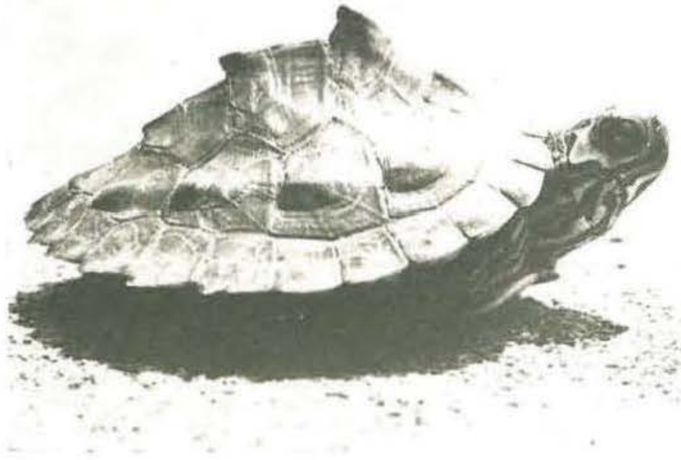
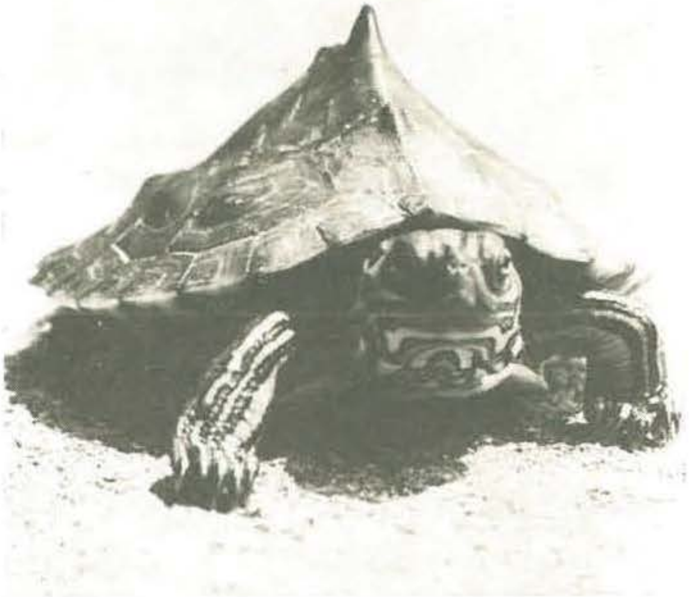


Barbour's Map Turtle

By VIRGINIA NEWMAN



BARBOUR'S Map Turtle is a rare reptile of limited distribution—principally the Apalachicola and Chipola Rivers and the Escambia River, all in northwest Florida.

Although there is presently insufficient evidence to support a growing fear that the species, *Graptemys barbouri*, is actually in danger of extinction, efforts are being made to find out more about the tiny turtle and to protect it. Possibly, its addition to our growing list of vanishing species can be avoided.

David S. Lee of Florida Southern College, Lakeland, became concerned about the fate of the rare creature while gathering specimens for his college museum.

After an investigation, he reported, "I became aware of the strong possibility that our native map turtle is presently in danger of extinction. Although there is insufficient data to support this belief, I think the problem facing this unique turtle should be exposed."

It is not certain whether or not the turtle is in serious danger because so little is known of its reproductive potential, its rate of growth, or even of its distribution. Its habitat needs within a river, its feeding habits, and its behavior are poorly understood, too.

However, Lee said, the fact that this reptile is geographically and ecologically confined to a small area, and because what is known of its living habits seem to indicate that it is especially vulnerable—these factors show the situation deserves immediate attention.

Barbour's map turtle, also called the "sawback turtle," is easily identified because of its small size and colorful markings. Adult females, which are considered fine eating by residents of the river areas, are from 7 to 10½ inches long. The male is a dwarf compared to its mate, reaching a final growth of 3½ to 5 inches. The name "sawback" comes from the horned back of the male. The third and fourth dorsal scutes, or scales, are raised. The first is slightly slanted toward the back; the other is smaller and more slanted toward the rear. Adult females lose their dorsal ridge entirely.

The "map" in its name comes from lines on the backs of some specimens that resemble a map or chart—particularly visible on young turtles.

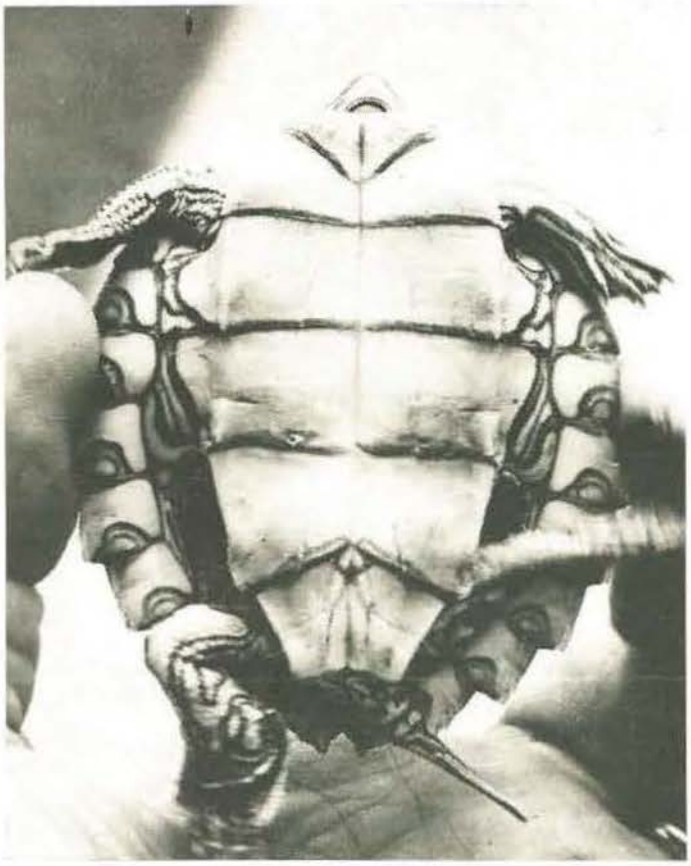
Barbour, of course, is for the herpetologist for whom it was named, Harvard's Thomas Barbour.

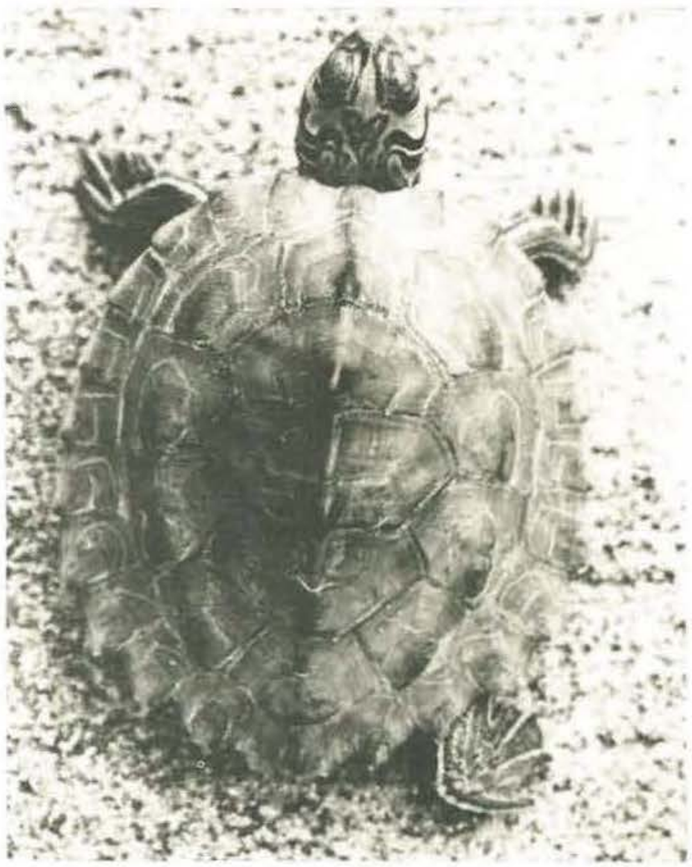
Colored an olive green with extensive yellow markings around the scales and on its head, it makes a colorful picture in the spring-fed rivers and streams like the Chipola, where it can clearly be seen lying on the bottom.

Beneath the surface, map turtles lose most of their shyness. They can be effortlessly collected by swimmers with face masks and swim fins. Unlike most other aquatic turtles, *barbouri* seldom swim away until closely approached or deliberately disturbed.

Too, the large head of the female is one of the reasons the turtle is vulnerable to man. It floats with its head above the water, making it easy to spot on the surface of the rivers.

Investigators have found that residents in the habitat areas like to catch what they call "these big-headed shell crackers" for food. One man said he and his two sons collected around 50 sawbacks in one mile of the Chipola River in a single afternoon. (The shell-cracking reference is to the turtle's ability to open fresh water mussels and snails with its strong beak. These are favorite foods.)





Photos By Gene Smith

Photos at left show bony ridge on the male Map Turtle's carapace, or top shell. Females, when adults, lose this mark of the species—and grow larger than their mates.

Lee questioned others who supplied information and, he said, "made it obvious that their knowledge of *barbouri* enabled them to focus their collecting in areas where the species reached its greatest abundance."

He also became aware of the absence of adult female map turtles, deducing that the smaller males are not as heavily taken. He wrote, "Only in remote pools bordered by shallow rapids did I find normal ratios of male and female turtles. In several places I found empty, bullet-riddled shells. Whether these represented individuals shot for "sport" or empty shells discarded as they were cleaned of their flesh is not known."

At the 1968 convention of the Florida Audubon Society, Peter Pritchard, a graduate student at the University of Florida, raised the matter of the threatened status of this unique Florida species. Sufficient interest was developed to pass a resolution requesting protection for this reptile.

In 1969 the Florida Game and Fresh Water Fish Commission extended protection against shooting to all fresh water aquatic turtles.

Lee, Pritchard, and others believe the map turtle previously received natural protection because it was relatively isolated from human populations. With skindiving becoming more and more popular, and with the addition of numerous boat landings along the rivers, these turtles are now readily accessible to man. The rising cost of living and the relatively low income of the area, too, may contribute to the further reduction of the map turtle population.

What can be done?

Lee said, "On the eve of a new era when conservation is becoming an important part of American culture, it would seem a disgrace to add this turtle to our list of vanishing species. Yet, any effort to protect *Graptemys barbouri* will be successful only if the biology of this turtle is thoroughly understood. In several years this may no longer be possible."

Capt. James Stevenson, chief naturalist for Florida State Parks, notes that park personnel are attempting to protect this turtle particularly.

Ranger Eddie Nesmith of Fort Gadsden State Park, located near Sumatra on the Apalachicola River, has personally collected several specimens for study and photographing. He has been pointing out the map turtle's uniqueness to park visitors for years, and has encouraged interest by state agencies and conservation groups for its protection. (Incidentally, Ranger Nesmith reports an encouraging increase in the map turtle population in his area this summer.)

During the next few years the status of this turtle should be carefully watched. An accurate, systematic study of the species should be conducted and the population checked annually. The extent of turtle collecting and the precise distribution and life history of this unique creature need to be determined—before it is too late. ●

Game Management Notes

Hunting with bow and arrow continues to grow in popularity each year in Florida. In a single season, the number of participants more than doubled, according to archery permit sales records. In 1968-69 there were 3,500 permits sold; in the 1969-70 season, 7,900.

"This increase was not exactly a surprise," says Gordon Spratt, assistant chief of the Management Division, Tallahassee. "When the Commission liberalized the archery hunting regulations, allowing bowhunters to hunt statewide in 1967-68 and to take deer of either sex during the '69-70 statewide archery season, it more than doubled the sportsman's chances of bagging a deer. We expect another increase in the number of archery hunters for the 1970-71 season."

The growing interest and participation in archery hunting the past three seasons in Florida indicated a need to measure hunting pressure and harvest—basic information needed to help biologists determine management practices and to aid the Commission in setting annual hunting regulations.

With those objectives in mind, a mail survey of Florida bowhunters was undertaken following the 1969-70 archery season. It was the first Commission survey of archery hunters.

The sample consisted of slightly over 4,000 of the known 7,900 archery permit buyers. Each recipient was asked to fill in the required information and return the form—in a postage-paid envelope—to the Game and Fresh Water Fish Commission.

Sixty percent (2,676) were completed and returned. (Five percent were returned by the post office, undelivered.)

Of the sampled deer hunters returning their questionnaires, 10.3% indicated they bagged a deer—239 whitetails for 2,312 archers. Wild hog hunters enjoyed twice that rate of success, with 1,130 hunters taking 236 porkers for a 20.8% kill rate, and they did it in roughly a third of the hunting time deer hunters took to achieve their mark.

According to the estimates of the total kill, based on the expanded survey results, the 7,900 bowhunters enjoyed 104,700 days afield and harvested 700 deer, 690 wild hogs, 40 wild turkeys, 2,000 squirrels, 800 rabbits, 80 quail, 16 fox, and three bobcats. Also reported taken were scores of such animals as armadillos, opossums, rats, snakes, and other unprotected species.

While the harvest was quite good considering the self-imposed handicap of the bow and arrow-user, it "did not appreciably affect the resource," says Spratt, underscoring the significance of the fact that a 21-day archery season provided nearly 105,000 man-days of outdoor recreation for Florida sportsmen while "hardly touching" the state's harvestable surplus of game.

Bowhunting continues to increase as a field sport in Florida. About 700 deer were bagged the "hard way" last archery season.

"In future years the Commission will undoubtedly make periodic checks of the continuing growth of the sport of bowhunting," Spratt says, adding that while the harvest of game by archers has finally become measurable—and, therefore, significant in resource management—"it is still below the average estimated annual road kill of big game in Florida."

Robert W. "Bob" Phillips of Interlachen was high scorer on the third annual Florida Game Managers Test, administered in April.

The comprehensive written test is for the employees of the Game Management Division who aid wildlife biologists in research and management programs.

According to James A. Powell, division chief, Tallahassee, the test is intended to encourage self-improvement through study and to recognize and reward general job knowledge and proficiency among game managers.

In announcing the winner of the 1970 competition, Powell said Phillips is assured of a trip to the October meeting of the Southeastern Association of Game and Fish Commissioners, which will be held in Atlanta this year, and that he has been recommended for a 1-step pay raise. He also received a cash award of $20.00 from the division chief.

Second high scorer was William L. Lane of Lake Worth, who won top honors in 1969. C. T. "Truby" Lee of O'Brien and Tommy Jackson of Sneads tied for third.

The test covers such subjects as wildlife identification, life history, and biology; plant and seed identification and classification; state and federal hunting regulations; and Commission administrative procedures.

The first Game Managers Test competition, in 1968, was won by Gary L. Weber, Tallahassee. ●

Water Levels

high and low water conditions often control fishing success and, when the rating is "flooded," anglers must change techniques—and work harder

By CHARLES WATERMAN

UPS AND DOWNS of bass population are often tied closely to ups and downs of water levels. Time was when we thought that a nice constant water level was essential to keep the fish happy and busy with multiplication. Now we know that water fluctuation is important, especially where pollution of one kind or another is involved. And where isn't it?

The biologists tell me that really high, flood-stage waters are likely to mean plenty of fish as they gradually recede but, while the water is really high, everybody has to work pretty hard for a living. It's like this:

A predatory fish like a black bass relies mainly on lesser fish for his meals. When the water gets deeper than usual, and spreads to a wider area, he has to hunt harder and go farther for his food. Simply a matter of the quarry having more area to hide in. Now this isn't likely to starve a bass, but it may keep him from becoming overweight. I'm a little vague as to what effect high water might have on spawning. If it occurred just before spawning time it might make it harder for the fish to get into spawning condition and might actually be harmful.

Forrest Ware, who fished with the author in an FCD conservation area south of Lake Okeechobee, is six inches taller than Waterman. He had just about that much freeboard on his waders angling the high water.

I'm talking now about extremes. The ups and downs, within reason, will expose large areas of the shallows to the air and will then cover vegetation that provides good cover and produces food. The exposed shallows will dissipate the harmful products of pollution, and everybody's happier when the water comes back. High water, of course, moves pollution to the sea, where it may not be welcome but will be more diluted than while it's in a river.

Last spring the high water didn't help my personal bass fishing much. When I went roaring out in late January to fish over my favorite grass flats on the St. Johns I found they were in pretty deep water—deeper than I've usually been successful in. The water stayed pretty high through most of the bass spawning period.

I then went down to Holiday Park in some of the Flood Control District waters and found that wading wasn't what it used to be. My companions were six-footers who kept some six inches of freeboard on their waders, even in the deeper spots. I had about two inches between my wader tops and cold water, which added little to my relaxation. When the breeze blew up, a little water would slosh over my waders. When I tried to climb back into the airboat I shipped a pint and this sort of thing went on for two full days. My friends kept complaining that the water was too deep for good fishing, but they caught fish right on. I couldn't catch anything, a sure sign that mental attitude has something to do with success. At the end of a second day, having caught only a couple of very small bass, I was all alone with a popping bug, sawgrass, and the deep water when a pretty good fish grabbed my weedless thing and dived down into the thick stuff. I couldn't move him and it was deeper over where he was. I couldn't wade over there so I said aloud, "My, isn't this an unpleasant situation?"—or something like that.

Just as I was about to slosh in over my waders

(*Continued on next page*)

(*Continued from preceding page*)

the fish came up, fagged out from fighting the leader in the grass, and I grabbed him. Maybe four pounds.

All of this was somewhat better than things had been going. My friends had caught enough fish and I turned him loose. When I met them back at the boat they refused to believe I had finally caught a bass.

BUT MY FISHING has been going that way lately. I went snook fishing with Milt Culp later in the spring. The high water had pushed the creek fish out around the Ten Thousand Islands on the lower west coast, and fishing wasn't particularly good for the time being. Later, they went back up the creeks again.

I worked pretty hard at it but spent a week catching barely enough snook to stave off starvation. Milt did pretty well. I can take a little adversity but this was pretty much because Milt is back from Viet Nam where the Viet Cong nailed him with a mortar. He was fishing in a 25-pound cast that covered the upper part of his body. One arm was free and he could move only the fingers of his other hand. He'd cast with one arm, then push the rod and reel over to where his fingers were, hang on to the reel handle, and crank with the entire rod and reel. Doing this, he caught roughly four times as much snook, by weight, as I did. And he isn't even a fishing writer.

MY CONTINUAL complaints about how baitcasting rod handles fasten on (see this column for the past ten years) came to a screaming new high the other day when I fared forth with a brand new rod with a trick way of fastening the ferrule into the handle, and found that the chuck wouldn't tighten down on the ferrule at all. No way.

Thinking there must be a method of tightening it, and that they couldn't have missed the boat that far, I took an extra hard twist and my knuckle hit the screw that is supposed to hold the reel on. The edge of that screw head was sharper than most fish knives and it laid open half an inch of knuckle on my forefinger. I have only about half an inch of knuckle on my forefinger.

With the blood dripping silently over the danged rod handle and down into the boat I made my first open accusation of capitalism, the establishment, and fishing tackle manufacturers. Since I had gone 57 years without such an outburst I feel I was entitled to one real tantrum. I am perfectly calm again now and am a little bit sorry for what I said, but not very.

THE BAIT TAIL is a jig-type lure with a metal head and a body of fleshy-looking and feeling plastic. It is fished much like any other jig and has been successful in both fresh and salt water. I am not going to say that it is the best jig made because I am a very poor jig fisherman. I do know that it is very, very good.

Al Reinfelder, one of the developers of the Bait Tail, hauled off and wrote a whole hardbacked book called BAIT TAIL FISHING. It's published by A.S. Barnes and Company and lists for $6.95. My first thought was that the cost of Bait Tails is high enough without having to buy a textbook about how to run one. Most lure manufacturers give the instructions on a little slip of paper—free.

But then I got to thinking that Reinfelder has actually done a complete and thorough work on how to fish jigs, going into more detail than you'll find elsewhere, even though you read a five-foot shelf of fishing lore. Of special interest to Floridans is a treatise on fishing from bridges with jigs, a thoughtful section that would be good for almost anyone.

So I'll recommend BAIT TAIL FISHING. If you have any aversion to Bait Tails you can use the same methods with other jigs. But Bait Tails, which I covered earlier in this column, rate some thorough trials.

I AM AFRAID that today's fishermen are much better than fishermen used to be, much as I would like to say that the experts of the good old days left bigger tracks.

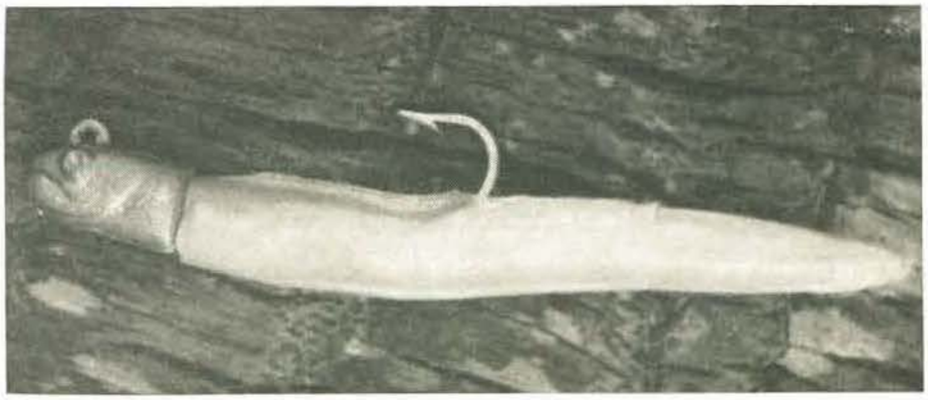
Today's fishermen are lazier, can't row very well, and aren't very accurate with their casting, for the most part, but they are catching lots of fish in waters which, in most case, don't have as many fish as they once did.

Now I'm going to list the developments of the past 20 years that have made better fresh water fishermen. Most of these things simply weren't used in this country until about 25 years ago.

First is the spinning outfit, the thing that made it possible to cast with little practice. The spinning outfit with its monofilament line became the ideal tool for fishing deep in both fresh and salt water. It has its shortcomings, but has a lot of good qualities to offset them.

Then, there were the jigs as applied to light tackle, and especially fresh water. For a while they had local names but they were applications of the old salt water jig, nevertheless. They were called by brand names such as "Doll Fly" and "No Alibi" in various parts of the country, but they were jigs and still are. With the spinning tackle, fishermen learned to work them. I can't see anything revolutionary in surface baits with the possible exception of "soft" materials, and the noisemakers like the Diamond Eye.

But there are the plastic worms and other soft,



The Bait Tail is a rather modest appearing type of jig, and the subject in full scale, hardbound instruction book written by Al Reinfelder, one of its developers.

crawly, deep-going things. Bait manufacturers had been trying to build them for 50 years but they used the wrong materials. They didn't have the lifelike plastics until recently.

Then, of course, there's the reliable outboard motor and more recently the electric motor for bass fishing. There were electric motors for a long time but they caught on very slowly, their recent popularity bolstered by human laziness and their silence. Electric motors are quieter than oars and paddles.

And finally, there are the fish-finding gadgets—fathometers really—that have cut a swath in deep waters especially.

And more leisure time contributes, too.

I RECENTLY had a letter from a man who wanted to buy a 12-foot glass fly rod. I couldn't steer him to one as those extra-long sticks are in disfavor lately. Most heavy salt water fly rods are nine feet long. Fresh water rods for bass and large trout are generally eight or 8½ feet long. Rods for panfish and smaller trout are frequently even shorter.

My correspondent didn't say what he wanted to use the long one for. Atlantic salmon fishermen used long rods until recent years and some of them are still employed by the English and Canadians in particular. In most waters they are inferior to our shorter rods, but they do have special uses.

For example, when fishing in an extremely fast river the fishermen may want to hold his line high to keep as much of it as possible out of the water. With a short rod the line is swept down so fast that he doesn't get much chance to fish his fly. That long rod business, I understand, is the way they do it on some of the bigger Norway rivers. I never fished there. Long rods are also used for distance fly casting in tournaments.

There are some anglers who use very long fly rods as they would cane poles or telescoping glass poles except that they have a reel fastened below the hand. I have often called this method "flop casting." They simply flop the fly or lure out as they would with a cane pole. They might even use monofilament or braided line instead of true fly line. Such outfits are sometimes used in "strip casting." You use a heavy lure or bait and simply throw it as you would in spinning, except that you coil the line in your hand or on the deck instead of paying it directly from the reel. It's a good way to throw soft baits that can come off the hook easily. I haven't seen it done lately. Spinning tackle is more efficient, unless you were brought up with strip casting.

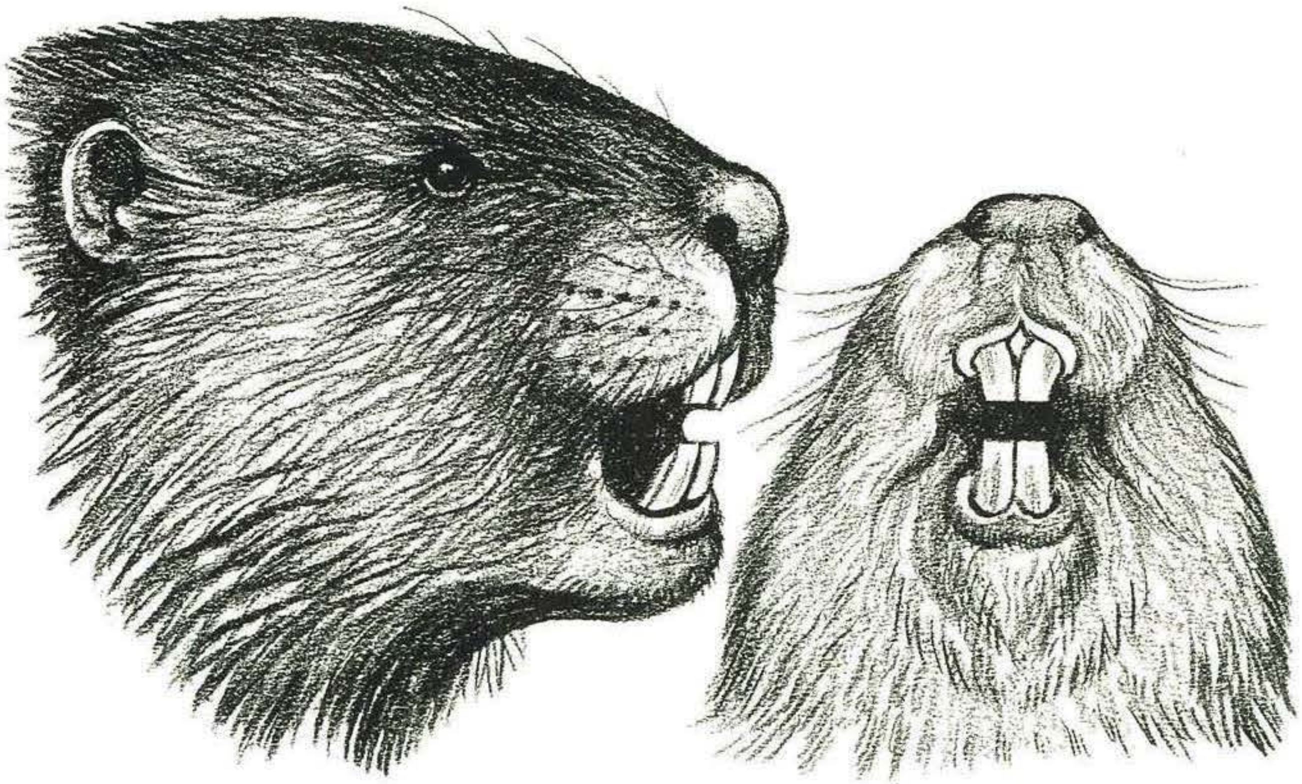
A SMOOTH BRAKE on any kind of reel is a big help in playing really big fish, but the thing most fishermen don't understand or consider is the matter of quick jerks against a drag. For example, once a run is under way the reel turns hard enough to give the desired braking action, and goes very smoothly. No rough spots to cause line or leader breakage.

But then the fish stops and you start working him in. Let's say the reel drag is set for five pounds, but when the fish makes a sudden rush at the last moment it may take eight or 10 pounds to start the drag moving again. So, your nice smooth payoff of line doesn't mean anything if you've already broken it on the fish's first rush.

A competition fisherman was telling me the other day that his biggest problem is getting a smooth start from some types of reels. He was studying different methods of lubricating the drag. One drag, he had decided, worked best with graphite on it.

I have always had a mistrust for the drag on an initial run. Consequently, I have fished bonefish with a very light drag, hoping to tighten it a little once the fish had things going, thus avoiding a hard jerk. Of course it's hard to tighten the drag exactly the right amount under those circumstances.

When working a big fish very close to a boat many breaks occur because the reel drag "freezes up" just a little, just enough that a sudden jerk will break the line. A drag is a simple device but its use is very complex. Almost every manufacturer claims a smooth drag. Most of them are pretty good at certain tensions, uneven at others. Most fishermen never hook fish that are large enough or fast enough to give drag troubles. ●



they live by their teeth

IF YOU WANT to know an animal's most intimate secrets, the best key is its teeth.

Just a casual review of teeth reveals much of the drama of animal life. They furnish the most reliable clues to the creature's personality, its sex life, and its place in the whole scheme of things.

Animals depend on teeth for defending themselves, for catching prey and eating it, and for building homes. Some animal babies would die if their mothers didn't have proper teeth with which to carry them. In fact, without adequate teeth some animals couldn't even breed!

Teeth come in all shapes and sizes—for every imaginable use. But you can't always look at an animal's teeth and guess how they are used.

A captive elephant with huge tusks calmly eating hay looks out of character—as if he has a lot of dental equipment he doesn't need. But wild elephants fending for themselves use their tusks to tear down trees and to gouge the bark off them for food. They can also dig holes for water with them. Adult males use them to settle arguments about who's top elephant, too.

You wouldn't think on first sight that a small parrotfish could bite off pieces of solid coral reefs, either, but it does, and eats them by grinding away with molars in its throat.

And wood-boring beetles have teeth strong enough to bite through silver, lead and zinc. You can't judge an animal's biting strength by its size.

The beaver probably best—and most commonly—illustrates the varied specialized uses to which a creature can put its teeth. His mouth contains saws, knives, grinders, rippers, rasps, and choppers! With these special "tools" he works adeptly as a lumberjack, carpenter, engineer, and maintenance man. He can gnaw through a 3-inch aspen tree in about 12 minutes. He can fell a 6-inch aspen, cut it into 6-foot length cordwood, and haul it all to the pond in a single night. Until the invention of the chain saw, no creature singlehandedly ever cut timber more efficiently than the beaver.

Some teeth have strange uses. The pike has them set flexibly in its palate. They easily bend backward, allowing prey to go in, but will not bend forward. Frogs and fishes thus trapped are then easily swallowed whole.

Some dental equipment is custom made for special jobs. The fangs of the trap-door spider point downward like those of a walrus. It obviously uses them pickaxe fashion in building its home in the ground. Other spiders' fangs operate sideways.

Teeth actually are secondary sex characters in many animals. For the male they may determine his ability, or inability, to win and guard females and to sire offspring.

Male shrews and rabbits, for example, seize the necks or backs of their mates during copulation. A mink, too, in order to hold his mate for a union that may last two hours, usually scars her skin, often by biting completely through it. This damaging habit is much to the disgust of furriers, but there's another way to look at the matter: No scars, no minks!

These scars are sometimes used by researchers to determine the number of pregnancies of the female mink.

As teeth go, so go many dramas in the animal world. Injury of the testicles of some animals causes deterioration of their molars. Injury to left testicles affects right molars, and injury to right testicles affects the left molars.

A male animal may break or wear his teeth out defending his harem and then have none left with which to clasp in copulation the wives he has won. It seems a cruel and unjust law. With the fires of procreation still burning, his family life is gone. The guy with the teeth takes over!

At least, nature has assured by this arrangement that those males who perpetuate the clan are stock of good teeth.

Many mouths are spectacular chopping and grinding factories, but some are superb maintenance shops as well. A rabbit does enough chewing to wear off about 20 inches of incisors a year. But he handily replaces the loss by growth—upwards of 10 feet of it in a lifetime.

A beaver, doing the work of a buzz saw, wears off tooth footage twice as fast. If such incisors get out of line and do not meet for cutting and wear, they can incapacitate an animal and he will die.

Cutting artists such as beavers have a built-in sharpening system. The inside portions of their incisors are soft and wear away faster than the harder outside. This arrangement gives them an ever-sharp, chisel-like cutting edge.

Dental maintenance for an elephant is different from that of the beaver and rabbit. Instead of the tooth growing longer, it is, in a manner of speaking, traded in for a new model when it wears out. The teeth of an elephant do a slow march forward all its life. When one drops out, the one behind it moves forward to take its place.

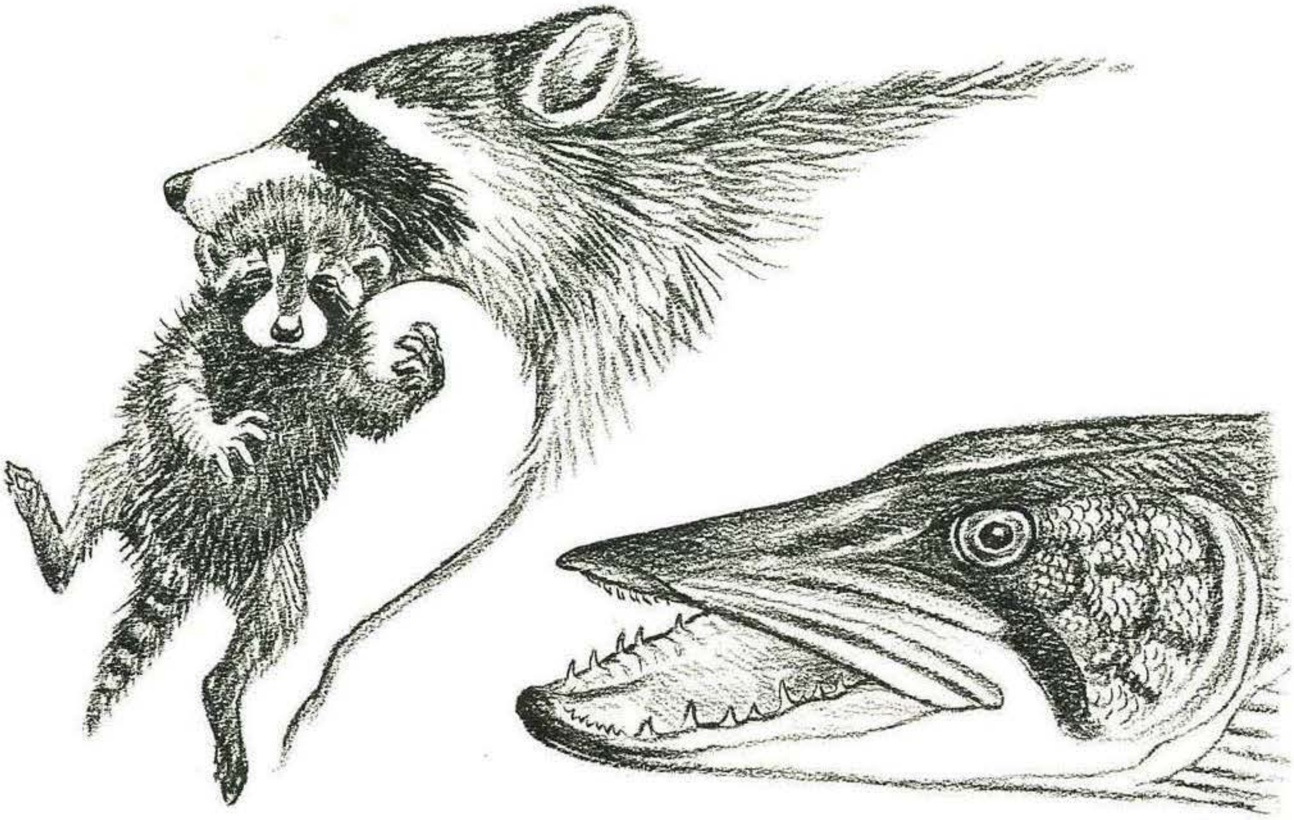
Numerous animals, particularly fishes, have this type accommodation. A shark's jaws have continuous bands of spare sets of cutters. When one row wears out, another moves forward. If a single tooth is damaged, a spare one behind it moves in to fill the space.

It seems that when nature provided certain snakes with poison and special dental equipment to deliver it, she also wrote them an insurance policy against loss. If a fang is destroyed, a new one replaces it in a very little while.

(Continued on next page)

By ROSS PHARES

The beaver's great incisors, left, are the tools of its well-known "trade," woodcutting. They are self-sharpening. A mother raccoon, below, transports her young to safety by using her teeth. The pike or pickerel effectively captures and holds its prey with needlelike teeth that angle backward for surer grip.



(Continued from preceding page)

Cleanliness is basic maintenance for efficient and lasting teeth. In healthy animals they are nearly always spotlessly clean.

How is this accomplished without toothbrushes and dentifrices? It isn't. Such dental care accessories are standard equipment for mammals. They have inside the lips, and sometimes on the sides of the tongue also, natural toothbrushes in the form of little rubber-like outgrowths. When the animal opens and closes its mouth these brushes automatically sweep up and down over the teeth in a dentist-approved cleansing motion. And as for dentifrices, animals were using enzymes for cleaning long before modern manufacturers of household cleansers ever thought of them. They're found in saliva.

The amounts of teeth in animals range from none, in such as birds and turtles, to uncountable numbers—and they vary in design from the simple to the bizarre. Furthermore, they are found in some odd places on the animals' bodies.

The female narwhal, an aquatic mammal of the Arctic, has a spearlike tooth that sticks out in front of her as much as eight feet.

The hagfish has no jaws, but uses movable plates for grinding.

Some "leather-jawed" fishes, such as the carp, have pairs of rudimentary crushing molars in the bottom of the throat that work against the base of the skull.

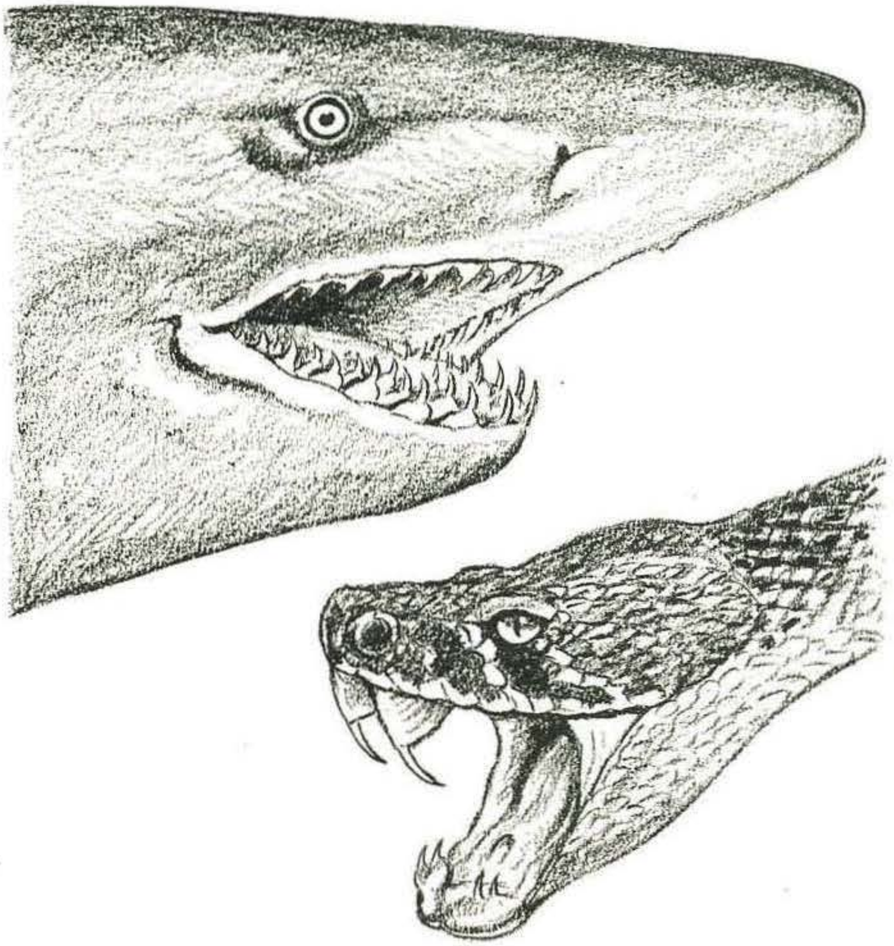
Some insects, including grasshoppers and cockroaches, have an extra set of teeth in their gizzards for grinding food.

A shark can "bite" from the outside as well as with its infamous, underslung mouth full of murderous teeth. It has "teeth" imbedded in its skin—with the tips bent backward, presumably to reduce friction as it swims.

The sea urchin's mouth, located in the middle of its lower surface, contains five converging jaws. Not only does this provide a way to feed; it also involves the animal's locomotion. It, in a sense, walks on the tips of its teeth!

By its teeth an animal creates its "tombstone," furnished with a clock set for eternity. Teeth remain even after bones have dissolved to dust. They may tell of life's important happenings, such as the number of pregnancies of a mother; the battles of a father. And they record vital statistics. Teeth, like carbon, lose radium at a constant rate. But in teeth, the loss is thought to be more easily and accurately measured than the radiation loss in carbon. Thus, the dwindling radioactivity of teeth tick off the ages, and we know with fair certainty how long ago the animal had its stay on earth.

Funny things, teeth. Useful in life; revealing even after death. By its teeth an animal lives, and by the teeth of another it may die. But to science, at least, it is the teeth that seem to live forever. ●



Many creatures have spare teeth that replace those lost naturally or damaged in "combat." Among them are the shark and the rattlesnake, left, the pickerel, and the garfish. Spare fish teeth usually come in rows; actually march up on line as needed! The fangs of pit vipers are replaced if broken.

The Golden Shiner

It's always the proud fishermen and their glistening trophies who get their pictures in the paper, but most of the time it was a lowly "pond shiner" that made it all possible. They never get any rave notices. But, at least, they're popular.

More people consistently catch trophy largemouth bass on live bait than on any other type "come on" used in Florida, and top choice in this department has for years been the native minnow called the Golden Shiner—*Notemigonus crysoleucas* to the academically inclined.

This beautifully colored, nicely proportioned fish, which attains a top length of 12-or-so-inches, is just about perfect for its role in life—providing forage for other fishes. It is a very prolific breeder; is widely distributed over the whole eastern half of the continent; is adaptable to a good variety of local aquatic habitats (although it has definite preferences here); and is utilized for food at every stage of its own growth and development. All predatory fishes dine on shiners—bass, pickerel, warmouth, speckled perch, and others.

Consider further that shiners can be grown for bait like worms. Pond culture is fairly easy. They thrive on a variety of natural or compounded foods; they're tough enough to withstand a reasonable amount of handling and jostling; and they keep pretty well in a close place.

Finally, you'd better believe a succulent Golden Shiner is just about irresistible to a hungry—or even a *half* hungry—bass. So bait fishermen love shiners as much as bass do. They buy them like hotcakes and feed them, one-by-precious-one, to Ol' Dippermouth.

We can only conclude from all this that the Golden Shiner is rightly named, not only because of its color but because it is practically worth its weight in the *real stuff* to bass fishermen inclined to bait fishing—and certainly to commercial hatchery people and retail bait dealers.

Of course, not all Golden Shiners used for bait are bought. Many, many are caught. This is a wild-growing, native minnow. It is found in grassy lakes and ponds and sluggish, weedy streams throughout the state. It schools at all ages. It'll take dough balls, bread, or worms on a tiny hook. Some fishermen use barbless hooks, the better to land their shiners in the bait bucket or live well unharmed. Catching your own is easier if you use chum to attract shiners to your dock or other favorite bait-catching place.

Chumming, by the way, is quite legal—for attracting bait minnows and for improving your fishing success as well. A favorite method of chumming goes something like this: Save up a few pounds of stale bread from the kitchen, or simply go out and buy a load of old bread from a bakery outlet. Tie it up in a weighted burlap bag. Sink same in a convenient spot. In a few days, shiners and other minnows will have been attracted to the chum. Fish for them with a minnow seine, a dip net, a cast net, a minnow trap, or by hook and line, as described. (Do take the time to read a copy of the Fresh Water Fishing and Hunting Regulations Summary for details on the permitted methods for taking bait in Florida.) Remember, however, that taking game fish with any type of net or trap is a violation of the law. But fishing with rod 'n' reel or pole 'n' line over chum is entirely okay.

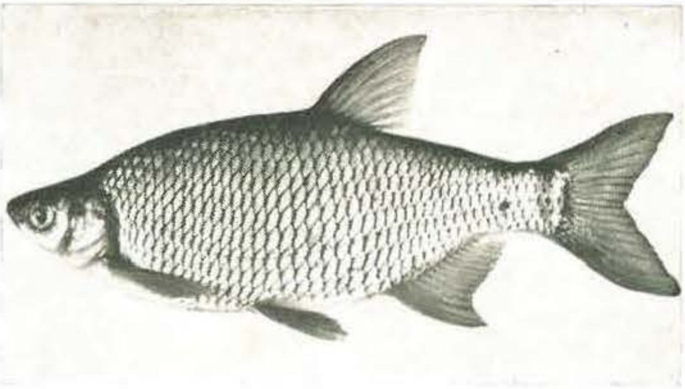


Photo By Vernon Ogilvie

The Golden Shiner, sometimes called "roach," is a widely used bass bait. Some fishermen hook their shiners through the lips; some through the back, behind dorsal fin; some near the tail.

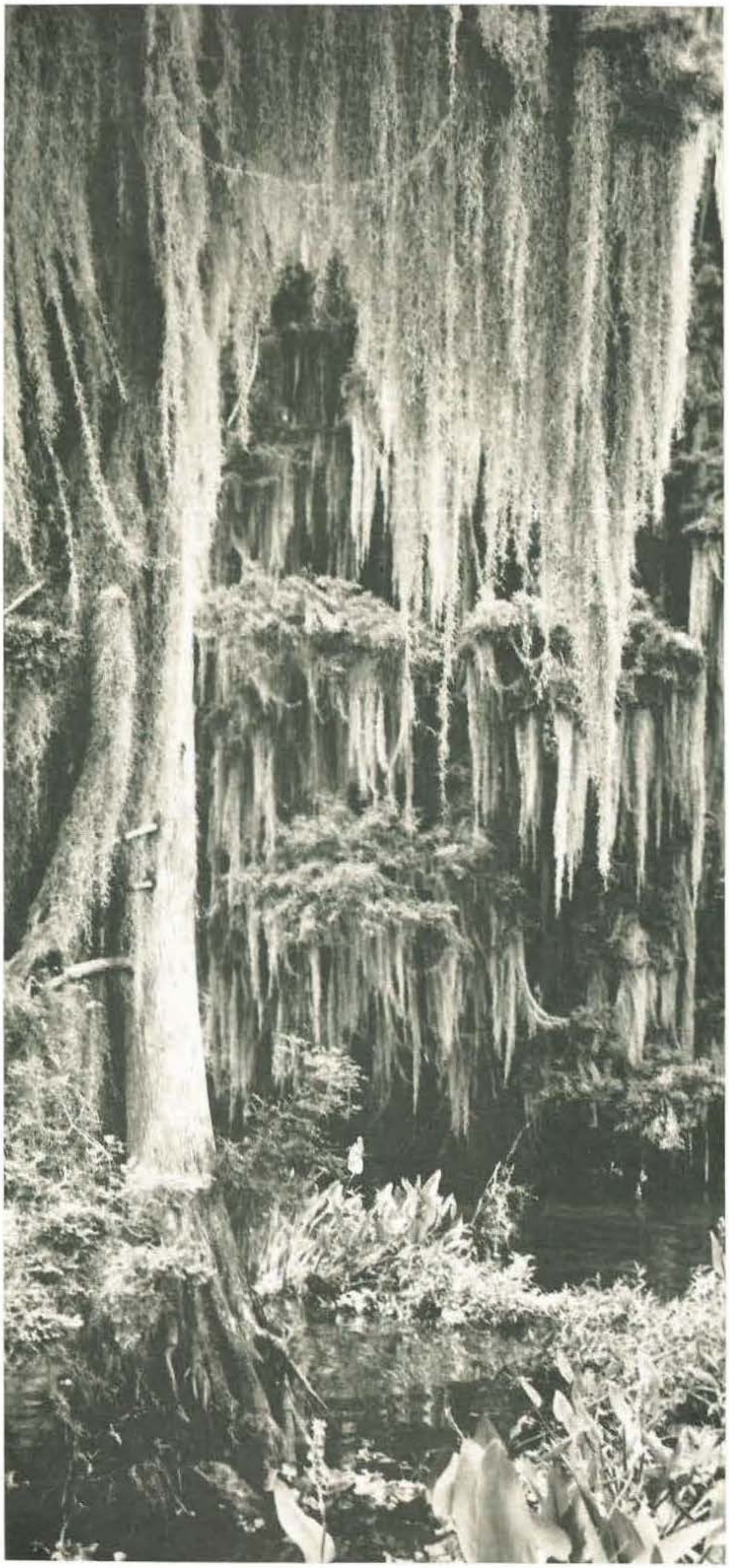
The Golden Shiner is actually a member of the same family of fishes as the imported carp and goldfish, but don't hold it against him. He's far more useful and rarely a problem.

Young shiners come into the world rather haphazardly. The female strews her eggs over any handy submerged vegetation, spawning throughout the summer months. The sticky eggs are fertilized by one or two accompanying males while being extruded. They settle and adhere to the plants beneath them, where they are lightly guarded by male fish until they hatch.

The young are easily misidentified. They look like several other common minnows but not at all like their parents. They sport a dark "racing stripe" the length of their bodies. With age they lose the lateral band and become gold in color, with some shading to silvery on their bellies. The fins are reddish.

Few fishermen realize that large specimens are edible. (The little ones, too, if you like "french fries!") Shiners, though, were never intended by nature for the game fish list. For live bait, however, they're virtually unbeatable. Small shiners usually bring speckled perch and little bass; big shiners get *only* big bass.

The latter truth perpetuates both the popularity of the "big shiner" fishing method and the fact that "the anglers take the credit, but the shiners catch the fish." ●



the survival question now
includes the most widely
distributed air plant
throughout the southeast

Spanish Moss

By MAC OSCAIR

Great strands of Spanish moss seem to "drip" from the cypress trees, left.

A MOSS GINNER once said, "As long as we have trees we'll have Spanish moss."

In fact, so prolific was the growth of this mysterious plant that even at the height of a modest moss-gathering and processing industry there was no danger of the species being threatened. Today, the moss gins are gone, the industry is dead, and the Spanish moss grows just as vigorously as ever. Or does it?

Scientists are not so sure. In October 1968, Mr. Anthony Jensen, extension forester with the Institute of Food and Agricultural Sciences at the University of Florida, Gainesville, received a report that clumps of dead Spanish moss had been found in Manatee County.

Soon other reports trickled in. They came from Orlando and from Ocala. Patches of dead moss were noted around Tampa. Spanish moss in Lake Griffin State Park near Leesburg was healthy and growing in November 1968. A year later the moss started to die. What had first been observed in Manatee County was becoming more widespread. But what was wrong with the moss?

Moss is not parasitic but too much can break tree limbs. Oaks, below, and open-crowned trees are favorable to Spanish moss. A pine is too "glassy" to offer a "grip." Several birds use moss in their nests—or build therein like Parula Warbler, right.

Photo By Gene Smith

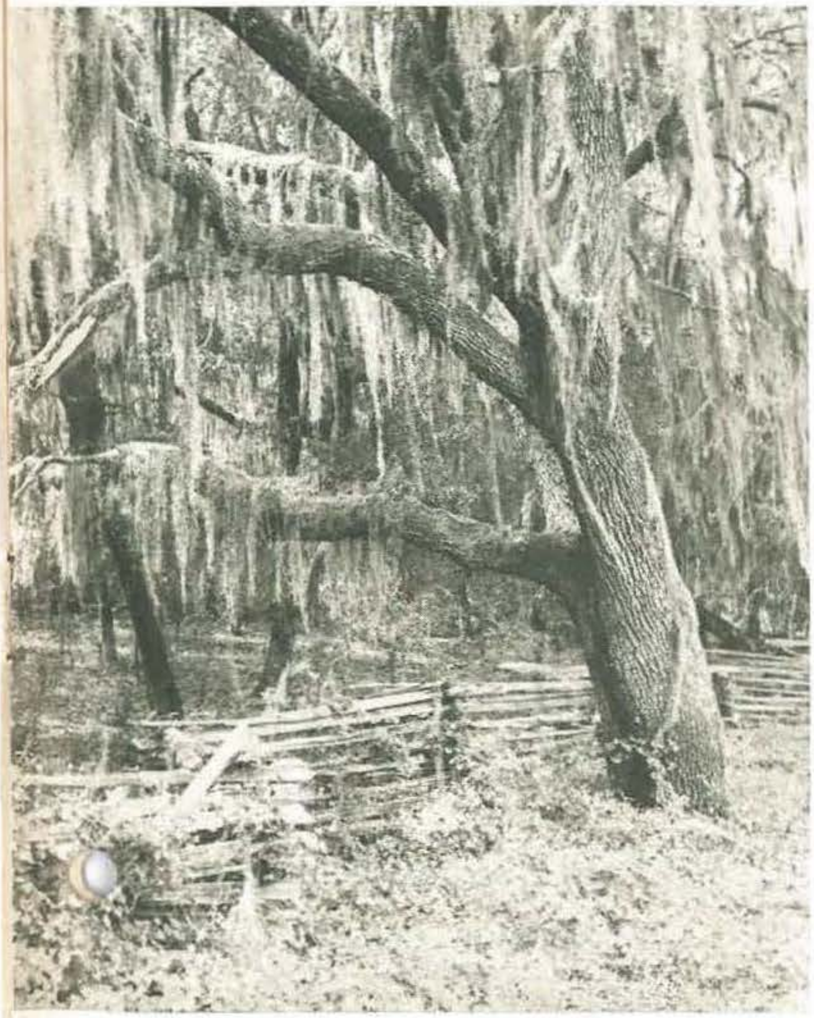


Photo By S. A. Grimes

Mr. Jensen had several theories but frankly admitted not knowing with certainty what was causing the problem. He felt that a fungus was a possibility—or a virus—or air pollution.

Dr. Daniel B. Ward, associate professor of botany at the University of Florida, favored the air pollution theory.

"Spanish moss is ultrasensitive to airborne pollutants. These pollutants are readily picked up by the fuzzy surfaces of Spanish moss. However, I prefer to think that it is a qualitative rather than a quantitative change in pollution," he stated.

Dr. Samuel E. McFadden, assistant horticulturist at the Agricultural Experiment Station at the University, also leaned toward the air pollution explanation.

It is his opinion that sulphur dioxide from industries using fuel oil as a source of power could be converted to ozone by sunlight. Ozone is known to damage tobacco plants, and there is reason to think it might also damage Spanish moss. Dr. McFadden feels that if the dieoff continues, Florida could lose nearly all her Spanish moss. This is a disturbing prospect.

Spanish moss grows not only in Florida but also in Louisiana, parts of Texas, Mississippi, Alabama, Georgia, the Carolinas and Virginia. Within its range, it hangs in great, sagging folds from trees

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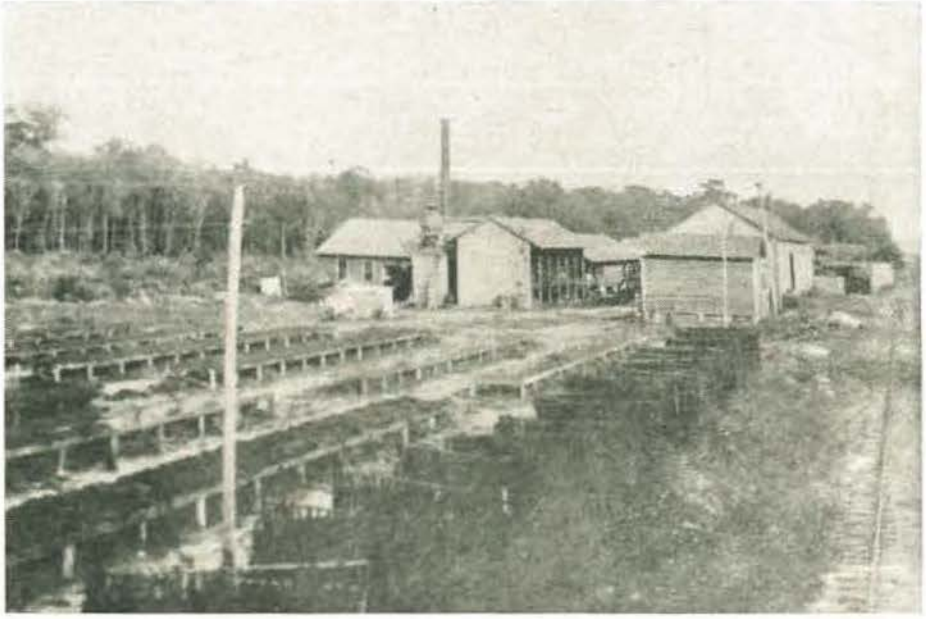


Palatka moss gin existed until 1922, when it burned down. Courtesy of Paul Salle.

(*Continued from preceding page*)

in one area, yet may be completely absent from an area nearby—only to reappear in profusion some distance away. Why this is so is not clear.

Spanish moss, also called Southern moss, Florida moss, and sometimes "old man's beard," is a member of the Bromeliaceae family of plants, the best known of which is the pineapple. It is an air plant, and like all air plants it traps and absorbs water through its leaves, thereby dispensing with the need for roots, (The moss combines water with carbon dioxide from the air and manufactures its own food by photosynthesis.) Spanish moss is not a parasite on trees. Trees are useful only in that they offer ideal mechanical support—"perching platforms" from which the moss hangs in long, gray, dust-catching curtains. It is, therefore, an epiphyte.

The long strands of moss produce tiny yellow-green flowers in the summer. When ripe seeds are cast off they are spread by the wind to other trees nearby. Some scientists feel that hurricanes are an important means of spreading Spanish moss—through fragmentation. In high winds, thousands of pieces of the plant will be snapped off and carried great distances. Some will be forcefully driven into cracks in trees and telephone poles. Others will be stopped by buildings, rooftops, chimney pots, and other structures and objects. Most of these bits of moss will grow into mature, healthy plants that in time will colonize their new area.

No tree is immune to Spanish moss, of course, but hardwoods, especially live oaks, are more likely to harbor these plants. In north Florida, pecan groves must be de-mossed periodically if they are to produce their best nut crops. Both the live oaks and pecan trees probably offer best growing conditions for Spanish moss because of their open crowns and horizontal branches.

Too much moss is not a good thing for any tree. Spanish moss can absorb several times its own weight in water when it rains. Consequently, in areas heavily infested with moss, branches can sag, split, and break off under the ponderous weight of wet moss.

But at the same time, the ability of Spanish moss to absorb large quantities of water may benefit its supporting tree. During heavy rain, the moss, by absorbing large amounts of water, reduces runoff and thus holds rain water in reserve. When dry weather prevails, the trapped water slowly evaporates and in effect produces a "humidity lid" in and around the tree. This layer of humidity reduces the transpiration rate of the tree, and, to some extent, may even reduce the rate of evaporation of water from the soil. Both functions can only benefit trees and nearby plants in times of drought.

Spanish moss may also be important in another way. Dr. Ward estimated that in an area with a dense growth of Spanish moss, 10 to 30 percent of the biomass—the total living material in an area—may consist of moss. This moss, by blocking out most of the sunlight, influences the type of ground plants that can grow under the trees. If the moss were to die or be removed, more sunlight would reach the ground and the plant community would adjust to the new light conditions. Some species would cease to exist; others would become more numerous; and some new plants would likely appear in the area. These changes, in turn, would effect a change in the types of birds and animals one could expect to find living above, on, and below the ground.

Tree-living creatures would definitely be affected by the demise of Spanish moss in Florida. Yellow Bats (*Dasypterus floridanus*) give birth and rear their young in thick folds of Spanish moss. The Seminole Bat (*Lasiurus seminola*) and the large Hoary Bat (*L. cinereus*) occasionally roost in the heavy-hanging, protective strands of Spanish moss—as does the Red Bat (*L. borealis*).

Several birds use this plant for nesting material. This is especially true of the warblers. Swainson's Warbler lines its nest with Spanish moss. It is thought that the Yellow-throated Warbler almost invariably builds its nest in hanging clumps of moss. The Parula Warbler uses Spanish moss to the exclusion of all other material for lining the inside of its nest. It is not common in the South. If Spanish moss disappears, the Parula Warbler must find a substitute nest-lining material or its population will decline.

When we consider that animals, notably raccoons and squirrels, and many birds make some use of this plant, either in nest building or as protective cover, Spanish moss emerges as a plant of importance in the flora of the Gulf States.

There is even a scale insect that lives exclusively on Spanish moss. This little fellow goes by the name, *Orthezia tillandsiae*. But the plight of Florida's Spanish moss—if it is a plight—has triggered little concern.

As Mr. Jensen notes, so little is known about the cause of the moss dieoff, there may not be reason for concern. The plant may simply be passing through an inactive period brought on by natural conditions. Anyway, it appears that little can be done at the moment. On the present scale of priorities it is hard to justify funds for research into the cause of the Spanish moss dieoff. It is not an economic plant. The result is that scientists at the University of Florida who are now attempting to find a solution to the puzzle must work with meager funds. It is mildly ironic to recall that at one time Spanish moss was indeed an economic plant.

Moss harvesting in Florida goes back 60 years. (In Louisiana, commercial interest in Spanish moss grew shortly after the Civil War.) Gainesville, Jacksonville, and Palatka all at one time had gins for processing moss. It was collected by hand, generally with the aid of a hook or blade attached to a long pole, and was piled in large heaps, or buried in long, shallow pits. This allowed the gray outer portions of the strands to rot away. The remaining portions, consisting of the central black fiber, were carefully combed and cleaned, baled, and marketed. These tough, resilient, hairlike fibers filled the cushions of automobile and railway coach seats, mattresses, chairs, couches, and even horse collars. The industry thrived up to the mid-1950's in Florida. But when the cheaper foam upholstering materials arrived on the scene, many of them synthetically and cheaply produced, the moss-gathering industry was doomed.

Today the moss gins are no more. Spanish moss is just Spanish moss, *Tillandsia usneoides*, a native epiphytic plant of the Pineapple family, the most widely distributed of the air plants of the Southeastern United States. And we recall the moss ginner who prophesied, "As long as we have trees we'll have Spanish moss."

Let us hope he's right. ●

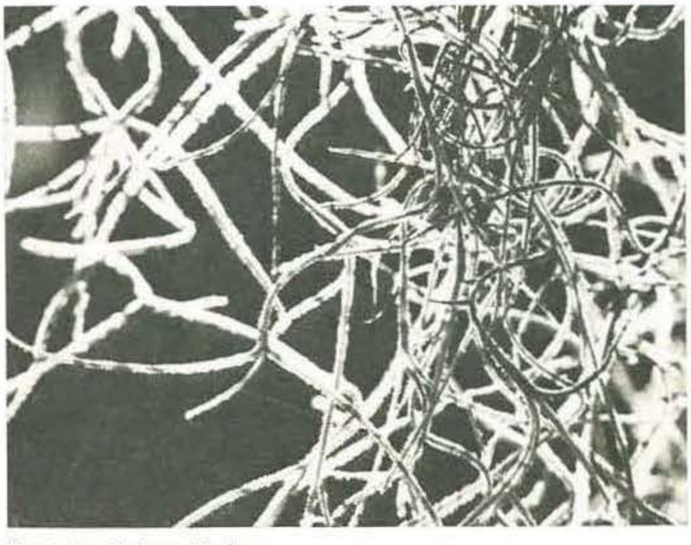
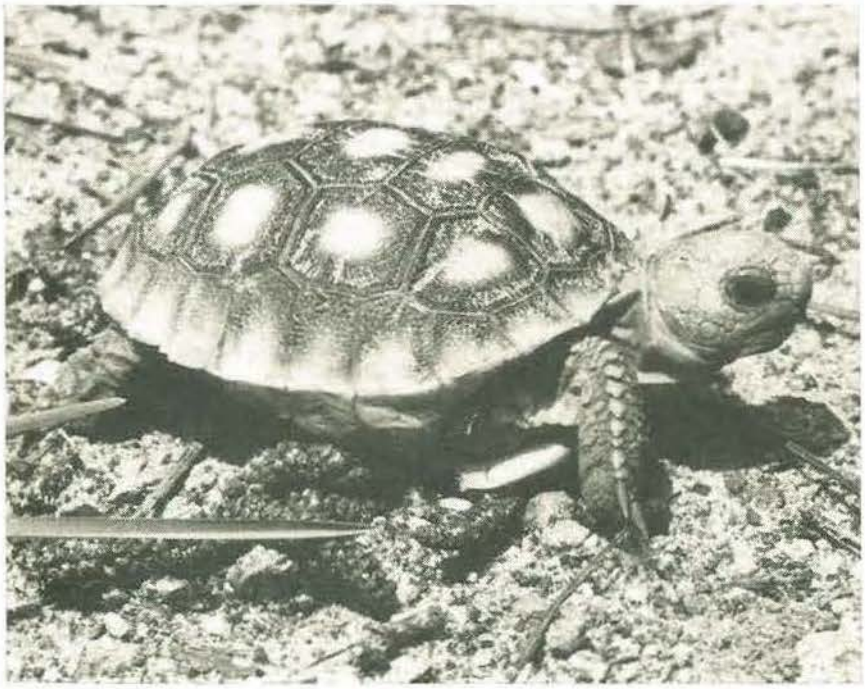
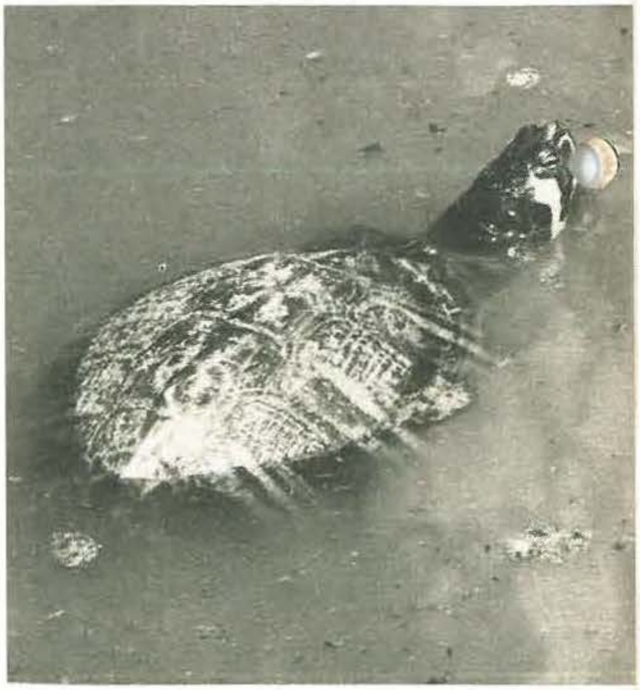


Photo By Wallace Hughes

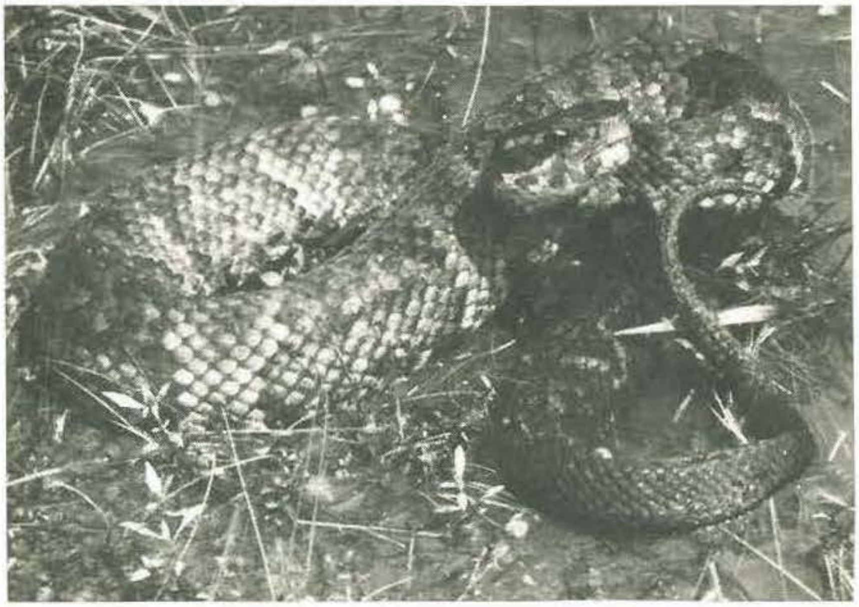
Dying Spanish moss is a strange phenomenon, but not yet alarming. In former years, however, moss was a commercial product. Gins, above left, produced a coarse black fiber, above right, for the upholstery trade. The fuzzy gray of strands, above, was permitted to rot away. Blowing fragments of moss can start a colony—anywhere, as shown at right.



Gopher Tortoise (juvenile)



Yellow-bellied Turtle

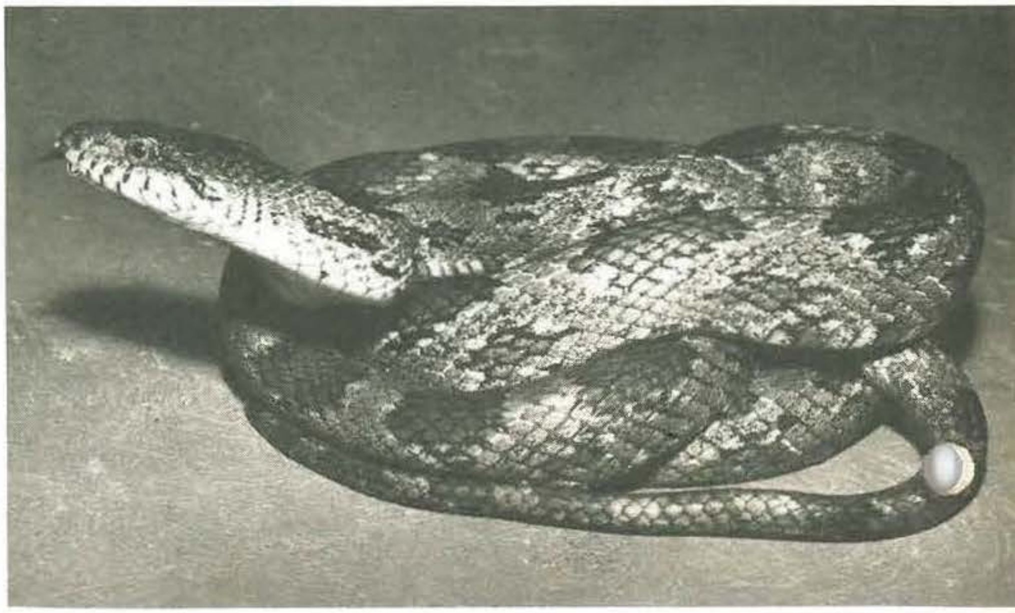


Cottonmouth Moccasin

Photo By Leonard Lee Rue III

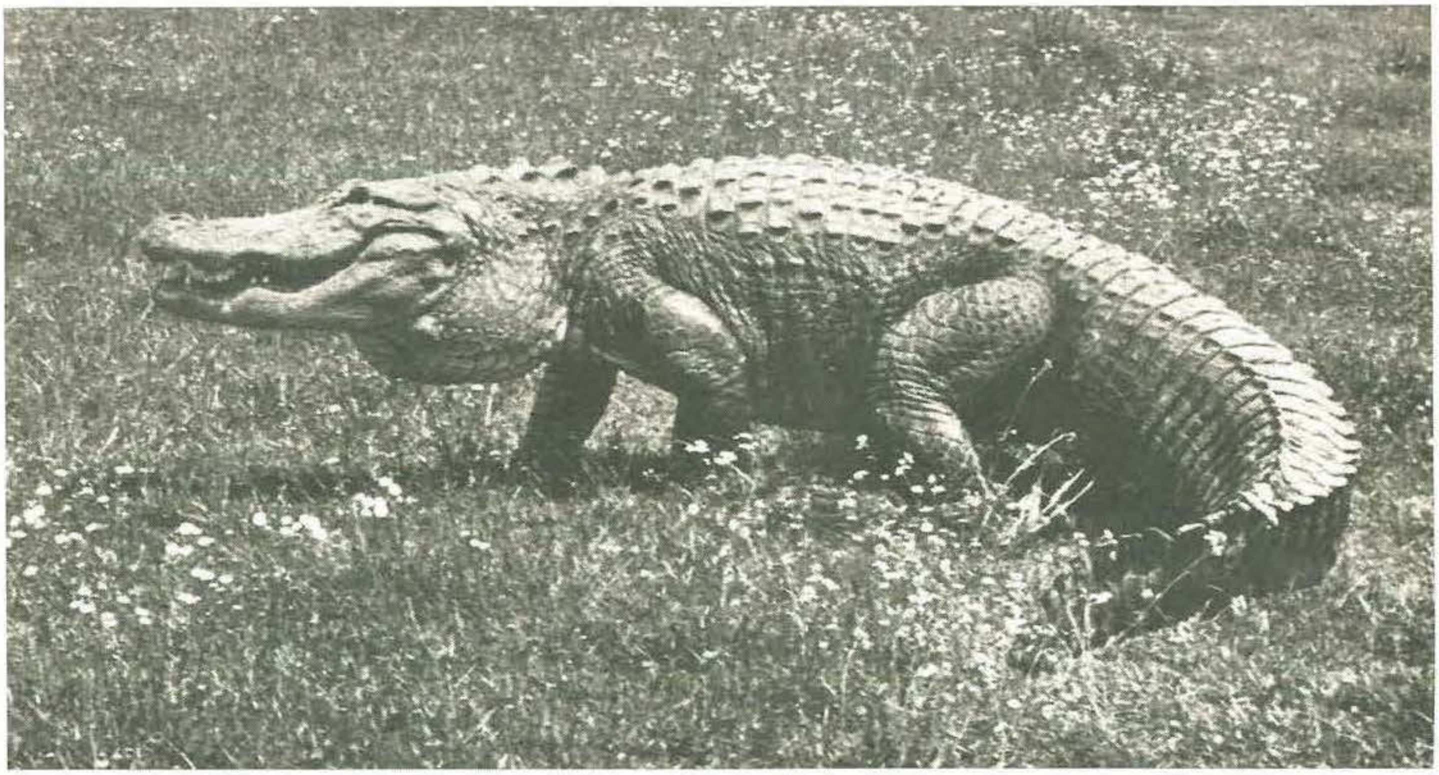
meet the Reptile Family

Corn Snake (Red Rat Snake)



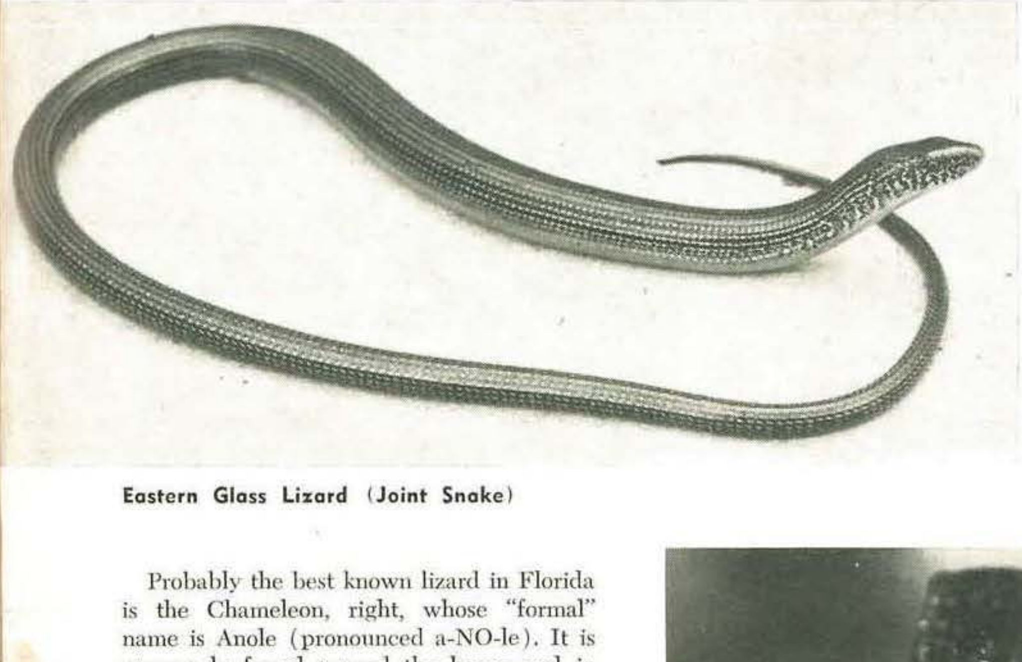
Turtles, snakes, lizards, and crocodilians—these four groups make up the Reptile Family. Turtles, of which some 35 kinds live in Florida, can be divided into two main types: land turtles, of which the little fellow at top left is one, and water turtles, represented by the shy specimen at top right. The Gopher is quite common but the young are not often seen.

Snakes may also be divided roughly into two groups: the poisonous and the non-poisonous. The dangerous ones are in the minority. An example is the defense-minded Cottonmouth, above. The others are the Rattlesnake (three kinds), Copperhead, and Coral Snake. All others, like the round-pupiled snake at right, are not only harmless but beneficial because they destroy rodent and insect pests. It is considered ecologically wise not to kill any snakes except venomous varieties near human habitations.



American Alligator

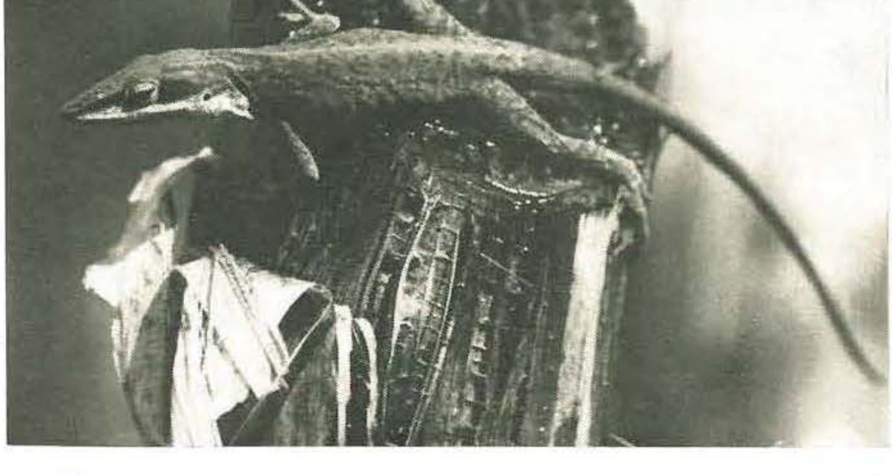
Photo By Gene Smith



Eastern Glass Lizard (Joint Snake)

Florida is world famous for its resident crocodilians—the American Alligator, which is common, and the rare American Crocodile. Also, some species of Caimans, imported from South and Central America, live in Florida streams and marshes. The crocodilians grow to large size. The record for an alligator is around 19 feet; average for an adult is six to 12 feet. Crocs and 'gators are valuable to the outdoor scene—and to the tourism industry. Hundreds of thousands pay annually just to see one. Florida would be a poorer state, economically and ecologically, without the alligator and its relatives.

Green Anole (Chameleon)



Probably the best known lizard in Florida is the Chameleon, right, whose "formal" name is Anole (pronounced a-NO-le). It is commonly found around the house and in the shrubbery, where it does a valuable job of insect control. Anoles can change colors "before your eyes," from vivid green to brown—and back again, depending on the background. The Glass Snake, above, is not a snake but a legless lizard. Its fragile body probably gave rise to the "joint snake" story. It, too, feeds on insects in the lawn and garden. To distinguish lizards from snakes, look for eyelids. Snakes have none; lizards can open and close their eyes. About 25 kinds of lizards live in Florida. All are harmless; all are helpful.

photo story

By WALLACE HUGHES

whether you hunt or fish—hike or climb—wade or walk—there is

Sole Music for Sportsmen

By **CHARLES WATERMAN**

I HAVE ELEVEN pairs of hunting boots and two business suits (winter and summer).

In addition to the fact that I am not exactly a socialite or executive type, this should prove that I consider outdoor footwear pretty important. Let's come right out and say I'm a nut on the subject.

I have sometimes confessed to the family bankbook that I owned too many fly rods or shotguns, but I've never regretted a pair of boots that fit. To a beginning outdoor type who wants to know what kind of boots to buy, I'd have to say there's no such thing as an all-around boot any more than there's an all-around boat or an all-around rifle. There are some that come pretty close.

If I wanted a pair of boots to hunt, hike or fish with all over the world, it would come out something like this:

They would be leather, about seven inches high, and have those Vibram cleat soles made in Italy. They would be one-half size larger than my Sunday shoes, and there would be a can of silicone leather dressing with them. They would lace up with either hooks or eyes, they would have either leather or extra-strength braided laces, and they would have soft toes that were firm enough to give some protection at the very tip. But, if I thought that kind of boot would be perfect for everything, I wouldn't have the other ten pairs.

Anyway, I have a pair that answers the above description. They happen to be the Bass Field Trial model, which is a fairly expensive boot of undisputed high quality. There are other companies that produce similar numbers. I am not in the boot business and I will not say the Bass shoe is better than the Chippewa, or the Russell, or some of the others I have worn, but they are pretty good.

Now, about that Vibram sole. The average Florida hunter needs those cleats the way he needs a wolfskin parka. Not only are they a bit heavier than some kinds of sole, but they will track quarts of sand and mud into the house. But I'll go for the Vibram because I might want to walk over some rocky ground some day, and might even sneak across the Florida border and climb a mountain. The Vibram is almost universally accepted as a climbing sole. It is so efficient that almost every

American boot manufacturer uses it on at least one model.

I have been there and back with the Vibram sole, and have the distinction of walking into a boot repair shop in the West and asking for a new pair of soles on my old boots. It's a distinction because the man in the apron told me very few people ever wear out Vibram soles. They have carried my quivering carcass through quite a few canyons in the past ten years, and I sadly note that I probably won't outlast another pair at my age. Incidentally, there are several ways of fastening a sole to a boot. The Bass number I have been talking about has the soles put on with brass screws. I figure that's pretty good.

The Vibram cleats are pretty stiff and if you catch them on a log or rock they'll trip you. Cleaning the mud out of them takes patience and fortitude. They are pretty solid and will not give you the soft, padded effect of rubber soles. Many people who walk for long distances have sponge rubber innersoles to make things easier.

While we're on the sole business, the wedge-shaped rubber one is pretty popular. It's generally fairly thick and will hold your foot just that much higher in mud or wet sand, a considerable factor in keeping dry feet. I have a pair of Chippewas with rubber (or synthetic rubber) soles which I have used for a lot of bird hunting and they seem to go on forever.

There are two ways of traveling over rough ground. One is to sock your heels in, plant your feet hard, and keep a solid stance. The other is to walk on top of the rough stuff with a soft step. The Indian moccasin used in mountainous country employs the latter system, requiring extra balance and a very loose gait. Clumsy ox I may be, but I prefer the former method and in mountains I like a boot with lots of heel support, plenty of arch built in and a fairly hard toe.

On Canadian trips I observed a number of guides and wranglers who used high moosehide moccasins with what they called "moccasin rubbers" (much like dress rubbers) over them. For mountain walking they didn't impress me a bit. They went a little quieter than I did with my clodhoppers, but they slipped and fell more often—and those were younger tougher, and more athletic guys than I. Their toes were always wet. That kind of footwear requires tough feet. I'll say this though: It's sure nice to shed your moccasin rubbers at the door or tent flap and pad around in those nice soft moccasins. It's especially good in cold weather up north. For Florida? Forget it.

When it's wet I can get along very well with those rubber-bottomed and leather-topped pacs, good bet for much Florida hunting and not bad for wear in a boat in cold weather. There is more tendency for your feet to sweat in those than with all-leather boots. Some models tend to bite your Achilles tendon where the leather and rubber are stitched together, and that's one thing you should look for. In the North there is more and more tendency toward lace pacs that are rubber all the way up. No leak where leather and rubber join, but there is somewhat more tendency toward sweating.

Boot height is always good for caustic comments by outdoor writers. Since the very high lace boots of 40 years ago have given way to shoes from seven to 10 inches high, it is stylish to say anything that comes up over your calf will cut off circulation, strangle your nervous system and cause your feet to drop off. Admittedly, high boots are less comfortable but, when they were stylish, a lot of pretty hard characters walked a lot of tough miles in them. With tight laces up to the ankle and loose lacing from there on up, high boots aren't nearly the ordeal they're supposed to be. You make a square knot at the ankle and then lace the rest of the way.

I am a firm believer in lots of socks. If you get the boots a little large and wear several pairs of absorbent socks your feet tend to stay comfortable.

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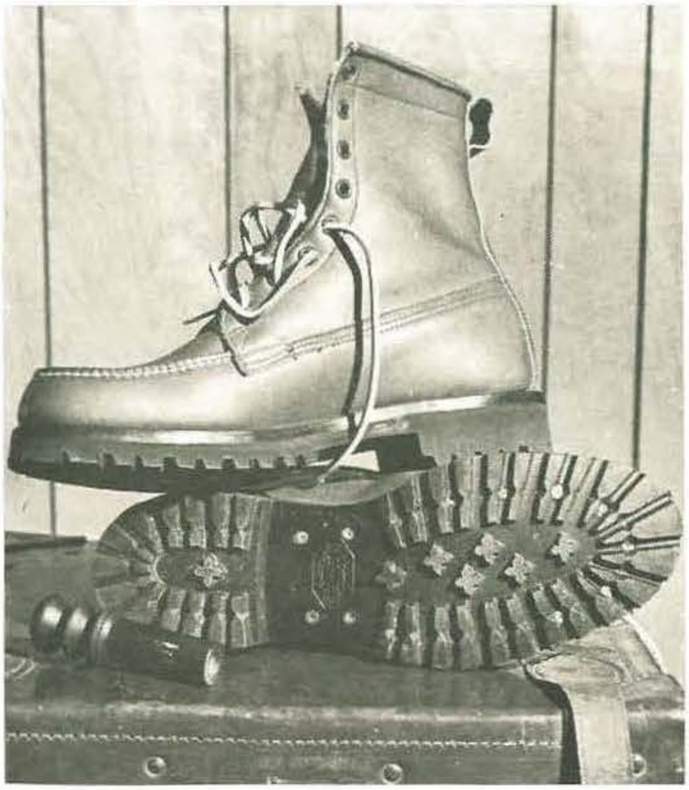

Good hunting boots, above left, like old dogs and favorite guns, are hard to part with. The nearest to an all-around boot, right, is the Bass Field 7-incher with Vibram soles.

Crawling hunters, left, aren't helped much by snakeproof boots. Closeup of canvas leggings, below, worn over rubber boots for snake protection. Typical hunting boots and shoes, at right, include plain moccasin in foreground, and others, from left: well-worn upland game hunter's boot with composition wedge sole, a Bill Acorn snakeproof boot, a rubber-bottomed boat shoe, an ordinary lightweight workshoe used by some upland game hunters, and rubber-bottomed pac with medium height leather top.

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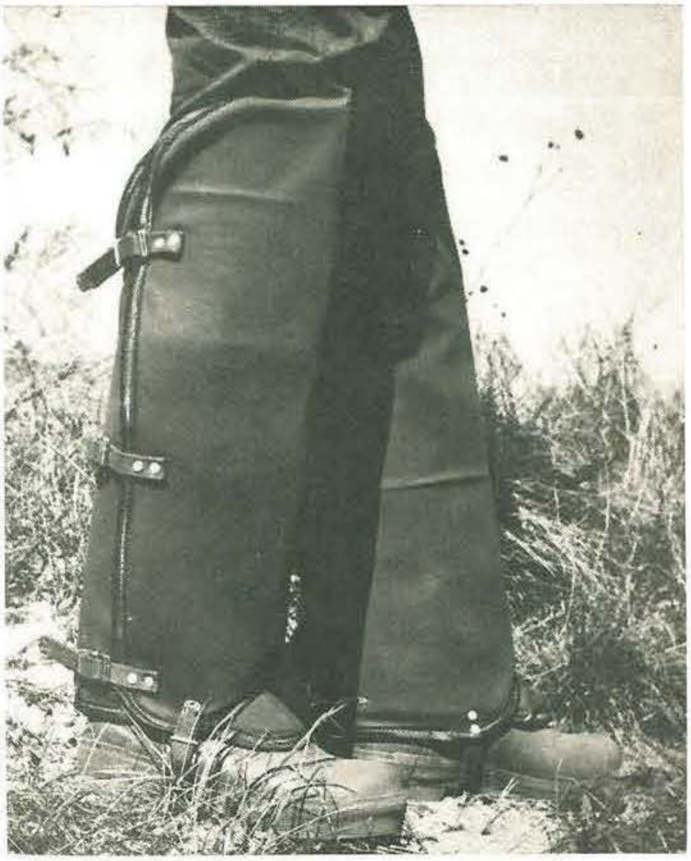
If they swell you can jettison a pair of socks and this takes away the critical problems of fitting. But if you buy boots for lots of socks, and forget to put on the extra pairs, your feet will slide around and you'll have blisters. One merit of extra socks is that you can change them when they get damp. If you get some kinds of insulated boots, one wetting will keep the inside damp forever, it seems. The later kinds of porous insulation dry out better. Either insulation or socks acts as padding.

Once your boots are wet inside they can be dried quicker if you fill them with warm sand or slightly heated newspaper. There are some electric boot driers on the market that work like a charm. I once became overeager when I got my hip boots wet and decided I'd warm some rocks in a campfire, drop them into the boots and take out the moisture. I got the rocks a little too warm and they burned their way out through fabric and rubber. You can't win them all, especially if you're a little feebleminded.

Comes now the inevitable business about snakes. You can buy some snakeproof boots so heavy that a big Eastern diamondback couldn't pierce them with a full swing and a running start. You can get slightly lighter "snakeproof" leather boots that *might* be pierced by a big snake with a perfect shot—a once in a million chance. A professional snake handler I used to know wore the lighter kind when hunting, and used the very heavy Gokeys in the snake pit. None of these boots resemble ballet slippers in any way, and I know some quail shooters who swear they'd rather take a chance with the snakes than walk with their feet in concrete. Now weight in boots never bothered me much for some reason. I have skinny legs but don't worry about a little extra leather or rubber as long as it doesn't rub where it shouldn't.



The snakeproof boots are usually made in the "field boot" pattern without laces and come up to the knee. As you break them in they tend to wrinkle in a few places, generally around the ankles, and the wrinkles are stiff enough to rub blisters in many cases. Lots of socks will help, but if you can remember exactly where your feet or ankles tend to rub raw you can put on a few bandaids and stave

off the agony. This has worked for me but it's too much trouble for some people who just won't use snakeproof boots.

Field boots are not made for long-distance hiking, and they tend to work my socks down, so I wear garters. Some socks are tight enough around the tops that they'll stay up most of the time, but a wrinkled sock can make things pretty miserable and I don't take chances. No field boot can be made to fit as well as lace boots and they are very hard for some people to put on—depends on the height of your instep and the shape of your heels.

So what are the chances of a snake striking through ordinary hunting boots? Not very good although it's possible. The more socks you have on, the farther the fangs would have to go through to reach your hide. Is a seven-inch boot high enough? Who knows? A six-foot rattler with a perfect shot could nail you through the open window of an automobile if everything was on his side, but it's never happened as far as I know. Pantlegs outside your boots could help deflect the strike, might cause the snake to take poor aim.

In most hunting the snake hazards are about like those from lightning, but if you're in known snake country you'd be silly not to take some precautions. There are snake leggings made of fiber glass, screenwire and canvas, and aluminum. None of these are quite as comfortable as pajamas, I guess, but they aren't as awkward as many hunters swear. I have worn all of these things at one time or another and my chief complaint was from brush and weeds catching in the part that went over my instep.

Some years back there was a rash of leather boots advertised as completely waterproof. Remember the ads showing a guy standing in water over his ankles, wearing leather boots and shooting mallards? The boots were guaranteed, and they'd send you another pair if the first ones leaked, which they always did. Finally you'd get tired of sending them back but they always leaked. At that time it worked out that if you put enough dope on the outside you could keep out the water, but you had the sweaty-footed disadvantaged of rubber boots.

Now there is a quieter approach and some new boots my friends say are truly waterproof if you'll apply a little silicone spray. I believe this is true although I haven't given such boots a trial. One swamp stomper of my acquaintance says that a leather boot can't be completely waterproof and still "breath," so you might as well wear rubber. Now I don't want into that argument. In the past I have counted on leather boots for a few steps while fording a stream, for a little operation in mud, and for short periods in wet grass. You can use silicone spray, boot grease, or a dozen other preparations I have tried (most of them work temporarily but can be worn off eventually). You can rub them with biscuits, bacon rind or neatsfoot oil for temporary waterproofing.

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The answer to sufficient ventilation for boots that must be waterproof, whether leather or rubber, is lots of socks or factory insulation. I am no longer prejudiced against factory insulation, but I cursed the old-fashioned insulations passionately and found them continually damp. I have even suspected they stuffed them with mildew seedlings and athlete's foot bacteria.

When it comes to wading there are a dozen compromises. Ordinary hip or sporting boots are generally satisfactory for shallow water, although the guy who makes the gadgets that fasten to your belt must do it on his day off. Lately, they have some shoulder harnesses that are more efficient.

Chest-high plastic waders with stocking feet and tennis shoes are popular in Florida. The very lightest and cheapest are likely to give trouble, and I'd buy somewhat better models. Put cotton socks over the feet before you stick them into the shoes and they'll wear better and be more comfortable—takes slightly larger tennis shoes. Florida problems are elementary compared to those faced by anglers who must walk over the terribly slick stones of some trout streams and must resort to expensive felt-soled or metal-shod wading shoes.

I wear boot foot waders most of the time. The cost (if you count the tennis shoes) isn't much greater and they're much easier to put on. Main disadvantage is that if you get in over the top they're hard to dry out overnight unless you have electric dryers. A hair dryer can work in an emergency.

I would like to say that the more expensive the wader the better the quality, but it just isn't so. There have been some terrible bloopers in the manufacture of waders in recent years, both here and abroad. Maybe the foreign ones are actually a little better on the average. I have never seen waders manufactured and after some of the things I have written I'm afraid to go near a factory, so I'll remain an amateur.

All I have to say on the wader subject is that you'd better test them before you go fishing. You can fill the bathtub, put on your new waders and sit down in it. You'll look funny but you'll find out if they leak. In recent years I have seen new $50 waders that were about as waterproof as mesh stockings. I suspect there is no good way of testing them at the factory without actually getting them wet, and they'd no longer look new if they did that. Generally, the leak is simply a faulty seam, but there have been occasions when the whole fabric of cloth waders oozed water—fast. Maybe they didn't put on the waterproofing gunk, but the reason is unimportant to a guy far from home where the water's cold and a sporting goods store is many miles away.

The most efficient waders when it comes to keeping out water and taking a beating are probably the heavy rubber ones with cloth backing as used by commercial fishermen. They are very heavy and somewhat warmer than light waders. All waders tend to condense moisture on the inside and some users wear an extra pair of pants which they expect to get damp and which they take off with the waders.

Those of us who spend a lot of time fishing in small boats are likely to get radical ideas about footwear there. The non-slip deck shoe of the yachtsman is easy on decks and equipment, and keeps you upright, but it has some disadvantages. For one, it's a canvas and rubber shoe, no matter what anyone says, and my feet sweat. Very cheap canvas shoes with a loose weave will let your feet breathe, but they are very unreliable status symbols.

I have pretty well settled on some crummy-looking rough-out Wellington boots with composition soles, bought half a size too large. They come up over your ankles, meeting your pantlegs, and keep the deerflies and mosquitoes off your ankles. If you walk around in the grass and weeds they protect from redbugs. They will turn a little water if it rains (most canvas shoes won't), and they can be kicked off instantly if you fall out of the boat. After a couple of years they look terrible. I believe I am now on my fifth pair.

Maybe I bragged back there at the beginning. Most of my 11 pairs of hunting boots are pretty well shot, but they fit so well I don't want to throw them away. ●

Chest height waders are the most practical for cool weather wading in Florida lakes.

Target Time

it may still be warm-weather time but the first hunting season is close at hand, and it will pay the true hunter to start practice sessions

By **EDMUND McLAURIN**

MOST HUNTERS are poor shots. Last season, for example, I witnessed a dove hunter's firing of three full boxes of shotshells to bag three birds. Much of the other dove shooting I saw could be rightly classified as poor, even though gunners did average more kills per box of shells than the chronic misser just described.

A lot of quail were missed, too. In good quail country, well populated with birds, I watched two hunters fire into a rising covey of almost a dozen birds without touching a single feather. Time and again I saw relatively easy singles missed.

Simply, most of the seasonal missing can be traced to lack of pre-season practice, especially unfamiliarity with the target flight angles likely to be encountered afield.

Beyond doubt, a lot of missing—and needless wasting of costly ammunition—could be eliminated if shooters would get out and do a little weekly practice shooting at thrown clay pigeons at least two months prior to *opening day*.

For upland game hunting practice, clay targets thrown from a handtrap by a companion offer the most varied flight angles. Seldom will two successive releases be alike, even if the thrower deliberately tries to make them so.

In the same beneficial practice class is shooting Crazy Quail. Clay targets are released from a revolving trap located below ground level. The rocketing targets take totally unpredictable flight directions.

Unfortunately, there are few readily available Crazy Quail setups.

Your best bets for acquiring expertness are sessions with the handtrap and/or visits to the nearest skeet range.

Shooting skeet—if you go about it in the right way—can really sharpen your aiming eye and gun handling coordination. Among the 25 shots comprisa round of skeet, one experiences just about every game target flight angle that can be expected afield.

Most communities have one or more skeet ranges, and patronage is usually easy and convenient for the average shotgunner.

Also, for skeet, you don't need a specially stocked gun, like the trapshooter, but can use your field gun if it has a selective choke muzzle attachment or is bored no tighter than Modified choke. If your shotgun has a selective choke attachment, set the device for Improved Cylinder.

Whether your skeet range practice does you much good will depend greatly upon your mental and physical approach to participation.

If you shoot dominated by determination to make a good score, or follow orthodox American skeet competition procedures, the practice sessions probably won't help you develop much gun handling dexterity for next hunting season.

Rules of American skeet permit the shotgunner to first place his feet just right, shoulder gun and even reverse a portion of the arc of his planned gun swing prior to calling for his instantly released target.

This so-called "wind up" undeniably contributes to higher scores, and can be considered almost mandatory technique for the serious skeet competitor.

But its execution contributes little benefit to live bird hunting. When hunting, one does not walk through woods and across fields with shotgun to shoulder, and rarely do live game targets take definitely known flight lanes and with such cooperating delay that the hunter can place his feet just right before attempting every shot. Usually, the shot has to be made quickly, from whatever shooting stance the gunner happens to be in at the moment, in one continuous fluid movement of hunter and gun.

Fortunately, there is a form of skeet shooting that offers almost perfect field gun handling practice. It is International skeet.

Under the rules of firing, the shooter is required to keep the gun off his shoulder, low enough in his hands that some portion of the butt-stock touches the top of his pelvic bone, until his target appears.

Target release is not necessarily instantaneous, as with American skeet, but may be varied by the trap controller anywhere from "immediately" to a delay of three seconds after the shooter calls "Pull!"

This means that targets usually are well along their flight paths before they can be picked up with aiming eye and the gun shouldered, swung and fired.

Admittedly, shooting International skeet is more difficult. It takes a bit more time to get into action, compared to the ready gun stance permitted under firing rules of American skeet. But gun shouldering speed and smoothness come with practice and, for

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the upland gunner, mean fewer misses afield and increased hunting pleasure.

When you go out to the skeet range, inform the official controlling the release of targets that you will do your firing under International rules. He or she will then know that the option of instant or delayed release of targets can be exercised.

Also, ask the person making up the squad firing order to put you down as the last man of the squad to take position on firing stations. Use the resulting interval to observe target flight heights and angles, and the footwork and body swing of those who precede you to firing stations.

When at firing stations, don't think about your developing score, your previously demonstrated expertness, or the superiority of other shooters in your squad. Instead, concentrate on each shot. Imagine that each released target duplicates a shot you can later expect to encounter afield. Keep paramount the thought that you are not trying to be a skeet champion, or even equal the scores of squad companions, but are on the range to learn how to hit quail, doves, ducks and snipe!

Let's see how targets fired on from the eight stations of skeet compare to game bird flight angles afield.

You are on firing Station 1, standing relaxed, feet comfortably spaced but with most body weight on your left leg, both knees slightly "broken" and body ready to sort of lean into the shot as you make it. Your forward placed left foot is toward the skeet field's center marker, near which you hope to break most of your targets.

In the International firing line stance your unshouldered but ready gun should be correctly held in hands with muzzle pointing about 30 degrees, close to the elevation path you expect the high house released targets to take.

(For low house released targets, waiting gun muzzle angle should be lower—just below the normal flight arc of low house targets.)

Your first shot at Station 1 will be a high house released target. It will come from directly behind you and sail over and away from you. To hit it, you will have to first "float" the target well above front sight and fire the moment the target appears to settle on the top of the bead.

Keep your head erect and prepare to quickly bring gunstock comb up to face—in line with your aiming eye as it picks up and tracks the released target. Never duck your head down to rising gunstock, but let gunstock comb come up smartly and find a firm, comfortable fit with your face and cheekbone.

Now, call for your target. . . . Wasn't that easy?

The low house released target at Station 1 is an incomer, like a game bird flying toward you, but veering very slightly to your left on the approach. This time you hold slightly under the target and fire when the front sight appears to be approximately at left edge of your incoming target. Follow through with your gun swing as you fire.

After the singles, you will be shooting doubles (simultaneous high house and low house target releases) at Station 1, 2, 6 and 7. All will be duplications of previously fired-on singles.

Don't feel tense and hurried simply because you are facing the challenge of two simultaneously released targets. Actually, you have plenty of time. Just concentrate on breaking the first one of firing order and, surprisingly, the second shot will usually be equally easy and unhurried.

There is a definite reason behind every miss. For example, practically all misses of single targets at Stations 2 through 6 will likely result from shooting behind the target—letting the target get ahead of you in relation to gun muzzle and not being able to catch up and swing past it for the required leads at these stations. At other times, misses will result from shooting under targets.

When you miss, try to analyze the cause and correct it. Likewise, when you score clean hits mentally review your performance. You'll learn fast.

From Station 2 through 6 you will be incorporating more body swing into your shots. For all shots that cross or angle to the right, activate gun swing by pivoting on the "back" leg. For shots that cross to the left, swing to the left by pivoting on the slightly advanced "front" leg.

The Station 2 high house target can be compared to a game bird that flushes from cover on your left and veers right. When you see about a foot of daylight ahead of your target, you have just about the right lead. Maintain it as you fire and follow through in gun swing.

The target from Station 2 low house approximates a hunting situation where a bird takes off in front of the shooter and both angles closer and to the left. This field situation is duplicated when the target from Station 2 low house passes the Skeet field's center stake marker.

Pick up the moving target and track it for a few yards and fire when your faster gun swing puts your front sight about 1½ feet ahead of the clay bird.

High house target at Station 3 typifies a field shot where a bird flies across the shooter's view and slightly away from him—like a mourning dove that changed its mind. About 2 feet of lead is about right. Fire after you have visually picked up your target and swung ahead of it.

Station 3's low house target is similar to a duck taking off from the hunter's right, gradually rising, and veering slightly toward him. Allow plenty of lead—about 3 feet—and maintain gun swing.

The high house target at Station 4 is a tough one. It is similar to fast-flying bird crossing the

When your shooting eye is sharp, and those reflexes fast, even unexpected shots can be easy.

shooter's field of view from the left at almost a 90 degree angle. A lead of at least 3 feet—even 4—is necessary. It more or less depends on how fast you swing and how well you judge the angle of elevation.

Station 4 low house duplicates much the same field situation, except that in this instance the target crosses from the shooter's right and at a slightly lower elevation. The required lead is about the same as for the previous shot, however.

Remember that Station 4 targets, like right and left angle game bird shots, require the maximum applied lead and undiminishing gun swing.

Target angles and flight paths take different perspective from Station 5 on, but you need to apply the same generous aiming lead and follow through that was needed for Stations 3 and 4.

The Station 5 high house target is analogous to a field shot at a game bird flying across in front of the shooter, heading from left to right, a few feet above eye level. About 2 feet of lead will be needed to score—along with that all-important follow through of gun swing.

The target thrown from the low house at Station 5 is comparable to a field target that crosses in front of the gunner in the opposite direction but at about the same elevation. Start with a fast gun swing and fire when the front sight appears to be about 3 feet ahead of the crossing target.

At Station 6 you are really facing the same condition you faced at Station 2 except for the different firing angle. The high house target comes in from the left and appears to gain slight altitude as it approaches midfield. Track the target until you get ahead of it for a lead that approximates 1½ feet. Fire and maintain your gun swing.

The low house target at this station is about like a quail suddenly emerging from brush on the shooter's right, crossing to the left, and gradually veering away as range extends. With a fast swing and a smooth follow through, only about a foot of lead will be needed to get a hit.

The high house target at Station 7 is an incomer—like a bird flying toward the gun, a little higher than the hunter's head, and drifting a little to the right as it comes.

Here the shooter must compensate only for the upward angle. No lead is needed. Shoot when the front sight appears to be just touching the lower edge of the target. The wide pattern of small shot will take care of marginal errors.

Low house target at Station 7 simulates a quail or pheasant suddenly flushing from nearby cover and departing in a straight line from the gun. Shoot when the target appears to be squarely on top of the front sight. Should any daylight be visible between the top of the bead and the bottom edge of the target, it should not exceed what appears to be 2 inches of separation.

Station 8's high house target approximates a passing duck or dove that appears without warning, close, fast, and almost directly overhead. Your best bet for scoring is to cover the bird with the gun muzzle and fire while simultaneously executing a very fast upward swing of the gun.

The target released from the low house of Station 8 can be considered almost a duplicate of the close, surprise type of field shot that the high house target simulated. Again, the target will have fast flight along an almost overhead path, but at lower elevation and with a slight veer to left instead of to right, as taken by the high house target.

Fire the instant you get on target and swing the gun hard in the direction of the target's flight for a fast follow through.

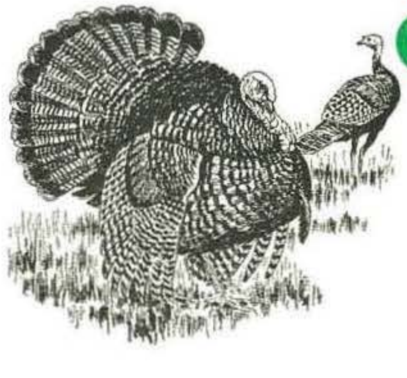
On both Station 8 targets, let your two hands and arms impart most of the needed gun swing. Body pivot is minimal at this Station.

Much of the pleasure of hunting is making clean, sure kills, and the more difficult the shots the more lasting and pleasurable will be their memory.

There is no reason why your bird shooting during the coming hunting season should be marred by too much missing.

You won't miss many birds if you practice by shooting International skeet before season—that's for sure.

Begin now to improve your field gun handling technique. But practice with the sole idea of *learning to hit field targets,* not as a competitor of other shooters on the range. ●



CONSERVATION SCENE

Bill to Aid Sportsmen

A BILL TO increase funds for wildlife restoration, hunter safety and range construction moved one step closer to passage in Congress early in June, according to the National Shooting Sports Foundation.

Rep. John D. Dingell's H. R. 12475 was unanimously passed by the House Committee on Merchant Marine and Fisheries. Similar bills have been introduced in the Senate, such as Sen. Hugh Scott's S. 3860.

The bill would take the 10 per cent excise tax on handguns out of general revenue and divert it to sportsmen's programs in the 50 state game and fish departments via the Secretary of the Interior.

Rep. Dingell said the new funds would be on a 50-50 matching basis between Interior and the states. The states would have the option of using one-half the total handgun tax money for hunter safety programs or range construction. The other half would go to wildlife restoration.

The handgun revenue is part of a package to "revise and clarify the Federal Aid in Wildlife Restoration Act and the Federal Aid in Fish Restoration Act," Rep. Dingell said. It was introduced at the request of many state fish and game departments and the International Association of Game, Fish and Conservation Commissioners.

The Federal Aid in Wildlife Restoration Act (known as the Pittman-Robertson Act) was passed in 1937. The 11 percent excise tax collected on rifles, shotguns and factory ammunition goes to the states on a 75 percent federal and 25 percent state matching basis. More than $400 million has been collected and used for wildlife research and management and acquisition of land.

The Federal Aid in Fish Restoration Act (known as the Dingell-Johnson Act) was passed in 1950. It funnels tax on fishing tackle to state conservation agencies for programs approved by Interior.

Warren Page, secretary of the National Shooting Sports Foundation, says, "Hunters and fishermen have always been proud to support the P-R and D-J Acts. Their tax money goes to improve fish and wildlife habitat and also improve environmental needs for *all* fish and wildlife, including non-game fish and wildlife species."

Rep. Dingell and others have been trying for four years to pass legislation similar to H. R. 12475. This is the first time one of the bills has moved all of the way out of a committee, Page says.

If H. R. 12475 does not pass the House floor and the Senate by the end of the year, it will die. Rep. Dingell said that whether or not the bill passes depends on an expression of individual sportsmen's views to their Congressmen.

Pollution Control Project

ON May 11th, the Controlling Board of the Florida Department of Air and Water Pollution Control approved an expenditure of $18,000 to finance a contract between the Department and the University of West Florida to develop a basic "mathematical model" for an estuary.

The project, under the direction of Dr. Joe A. Edmisten, of the university, will take about 12 months, and reduce to mathematical formulae all of the dozens of factors which enter into a comprehensive survey of an estuarine area.

The Pensacola Estuary has been chosen for the pilot project.

Florida has thousands of lakes, dozens of rivers and streams, many bays, and over 2,000 miles of salt water coastal areas. This enormous volume of waters which must be sampled for various data vital in pollution control, means the Department would require the full-time services of hundreds of chemists and other engineers if a thorough job is to be accomplished.

To overcome this drawback, the Department's systems engineer, Eddie E. Ellis, has designed a water quality monitoring system which provides for remote censors to feed data automatically into a computer.

The computer, armed with basic mathematical models (or "programmed," if you prefer) for these three types of waterways, would constantly monitor the waterways and advise the Department almost instantly when any factor in a body of water reaches its own predetermined limits.

Bodies of water have a *waste accumulation capacity*, or *assimilation capacity*. This means that each has a certain capacity to absorb pollutants and dispose of them through natural processes without deterioration of the water. The capacity is based on dozens of factors, such as the physical size of the body of water, characteristics of its circulation, speed of flow, interactions of fresh and salt waters—things like that.

The pilot project about to get

under way will reduce each of these known factors to a mathematical formula. The computer will correlate all the formulae to arrive at a basic mathematical model which will be valid, with slight modifications, for any estuarine area.

Department engineers will then know with great accuracy the total amount of pollutant material which can be placed safely into that body of water and still keep the water from deteriorating. An adding machine applied to known pollution sources emptying into that water will tell the engineers whether output from these sources must be reduced, on some basis, to keep within the water's ability to absorb wastes.

A logical follow-up to this project will be pilot projects to develop similar mathematical models for lakes and for rivers.

A computerized system will enable the Department to put the water quality control strategy on a 100% objective basis, rather than on consensus opinions as is necessarily the case today.

Hunting Season Information

Migratory Game Birds

Marsh Hen

Marsh Hen (Rails and Gallinules): September 5 through November 13

Shooting Hours: One-half hour before sunrise to sunset

Bag Limits: Clapper & King Rails; Daily Limit 15; Possession Limit 30 (singly or in aggregate)

Sora & Virginia Rails; Daily Limit 25; Possession Limit 25 (singly or in aggregate)

Florida & Purple Gallinules; Daily Limit 15; Possession Limit 30 (singly or in aggregate)

Mourning Dove

Mourning Dove (three phase) October 3 through November 1*
November 14 through November 29
December 19 through January 11

*During the Oct. 3 to Nov. 1 phase, in the Western Zone, that portion of Franklin County lying east and south of U.S. Highway 98, including Alligator Point, will be closed to dove hunting.

Shooting Hours: From 12-noon to sunset

Bag Limits: Daily Limit 18, Possession Limit 36

Complete waterfowl hunting season regulations and information will be available soon after mid-August release by the U.S. Bureau of Sport Fisheries and Wildlife.

Man at Grips With Nature

A FRESH, HIGHLY disturbing but stimulating view of the human species at grips with its own, disastrous effects on nature is supplied by a leader in scientific conservation, Max Nicholson, in a major work on ecology: *The Environmental Revolution — A Guide for the New Masters of the Earth* (McGraw-Hill).

"Awareness of the decisive importance of the disturbing vulnerability of man's natural environment is bursting upon most alert and public-spirited people," the author notes in his Foreword. "The pride of having reached the moon is cancelled out by the humiliation of having gone so far towards making a slum of our own native planet. . . . If our environmental revolution is to prove less of a shambles than most we must correctly marshal the events and forces leading up to the present situation, evaluate the weaknesses, the mistakes and the progress which has been made, and find a sound and acceptable basis for judging where we go from here. That, roughly, is what this book is about."

Nicholson envisions the ecological revolution amid which we live as being, on one hand, "a man-made change, sudden and worldwide, in our natural environment," and, on the other hand, the transformation of our own attitude toward that environment:

"By going so far as he now has towards taking over the earth from nature man has made it inevitable, not only that he should manage nature, but also that he should henceforth learn to manage himself as part of nature." In just under 400 well-documented pages, and with the help of more than 70 illustrations, line drawings, and two color maps, the author presents a picture of the emerging relationship between man and nature arising from successive human experiences and advances. and from recognition of failures and misdeeds. The book "recognizes that all of us are caught up in attitudes and beliefs which are no longer tenable, and which we must find means to unlearn and to replace by a new approach as soon as possible."

Nicholson analyzes the evolution and developing practice of what he sees as "the two distinct but closely linked and converging types of human conscious intervention in the environment." One, which can be defined as landscape and land use, is concerned with "visual, spatial and physical aspects expressed in planning, design and management of the land generally, as well as of particular sites." The second—conservation—is concerned with "human restraint in utilizing natural or semi-natural areas."

The book frankly discusses controversial issues, and offers novel ideas concerning "where we go from here." ●

Smallbore Rifle Guidebook

By EDMUND McLAURIN

ANYONE IN FAIR physical condition and possessing reasonably good eyesight (natural or helped with prescription glasses) can become a good shot today. There is plenty of expert guidance to be had, no matter where you live.

It wasn't as rosy for a shooter when I was a boy. Then, the various firearms manufacturers took care to turn out well-made guns and get them in the hands of retail dealers, but learning to use them expertly after purchase was your problem.

In fact, it was not uncommon for a certain large firearms manufacturer to simply ignore letters asking technical questions or seeking some solution to a gunsmithing problem.

Remington was a notable exception. Any inquiry or shooting problem presented to that firm by a consumer brought prompt reply, just as a similar presentation does today.

The Sporting Arms and Ammunition Manufacturers' Institute, which for years has represented a long list of supporting trade affiliates, realized the national need for a good giveaway rifle instruction handbook. The member-manufacturers thought the idea good and authorized officials of the SAAMI to call on Colonel Townsend Whelen, then acknowledged as America's foremost firearms authority and gun writer, to prepare a guidebook for new shooters.

Colonel Whelen did a very thorough job. The result was THE SMALLBORE RIFLE HANDBOOK—authoritative, technically accurate, and published without advertising, other than a list of SAAMI trade affiliates on the inside cover.

The motivating idea behind the book was for individual manufacturer affiliates to pack one of the helpful handbooks with each rifle marketed.

But somehow this specific objective got sidetracked. Relatively few retailed sporting rifles ultimately reached their consumers with a packed copy of Colonel Whelen's shooting tips. Either manufacturers overlooked inclusion in rush of shipping or, more often, retail dealers did not save the handbook when unpacking firearms for store display.

Even so, the SAAMI continued to publish and distribute many thousands of copies of SMALLBORE RIFLE HANDBOOK every year, aided by publicity given the guidebook by the NRA and shooters who had benefited from its reading.

In those days, you could get one by writing for it—at first, free of charge; later, by sending 15¢. Either way, the effort to obtain a copy was well spent.

Today, Colonel Townsend Whelen's book is still considered one of the best rifle instruction manuals ever written.

After obtaining and giving away hundreds in the interest of promoting the shooting sports, I now have only one copy left, a 1937 edition. It is not for sale and is no longer being loaned.

I have read my copy so many times I can recite some passages, but I still enjoy reading the book's various chapters. Along with National Rifle Association instruction manuals, I use THE SMALLBORE RIFLE HANDBOOK to support firearms talks and clinic demonstrations.

Since by 1953 almost half a million copies had been printed, I'd say your chances of getting one are good. In fact, I'm reasonably certain that National Shooting Sports Foundation, 1075 Post Road, Riverside Connecticut 06878, distributes an updated version, with current rifle model illustrations, for 25¢ per copy.

Whereas my older edition is titled SMALLBORE RIFLE HANDBOOK, the Foundation's publication is titled HANDBOOK ON SMALLBORE RIFLE SHOOTING. It is so listed on the NSSF's rundown of instructional aids available to shooters. Chances are good the two texts are simply far-apart printings of the basic volume by the late Colonel Whelen.

In the old days, unless one got started right with the aid of one of the first editions of SMALLBORE RIFLE HANDBOOK, shooting guidance was usually hard to come by, and especially so if you lived in a small town that lacked likely contact with some shooter of range experience and coaching ability.

During my boyhood I was lucky. I not only liked to read—and read every text I could find about guns—but I developed valuable contacts and friendships as the years rolled by.

National firearms personalities like Major John W. Hession, Captain Edward C. Crossman, Major General Julian Hatcher, C.S. Landis, Thurman Randle, and Olympic Champion Morris Fischer evinced interest and took time to help me develop as a marksman. John W. Fecker, the telescope authority of his day, took pains to indoctrinate me in the working principles of scope sights.

Colonel Townsend Whelen wrote me regularly, often in great detail, and in time urged me to better serve the shooting sports by qualifying as a Certified NRA Marksmanship Instructor and by writing educationally, based on my own increasing firearms experience and knowledge.

Yes, I was fortunate—very fortunate. The best of the gun experts of their time graciously shared their best with me.

The years have brought many changes. Sadly, the named personalities have passed on, one by one. Who among those of us who read and remember their magazine articles does not miss the helpful writings of Colonel Townsend Whelen and Captain Edward C. Crossman?

For that BIG ONE that didn't get away

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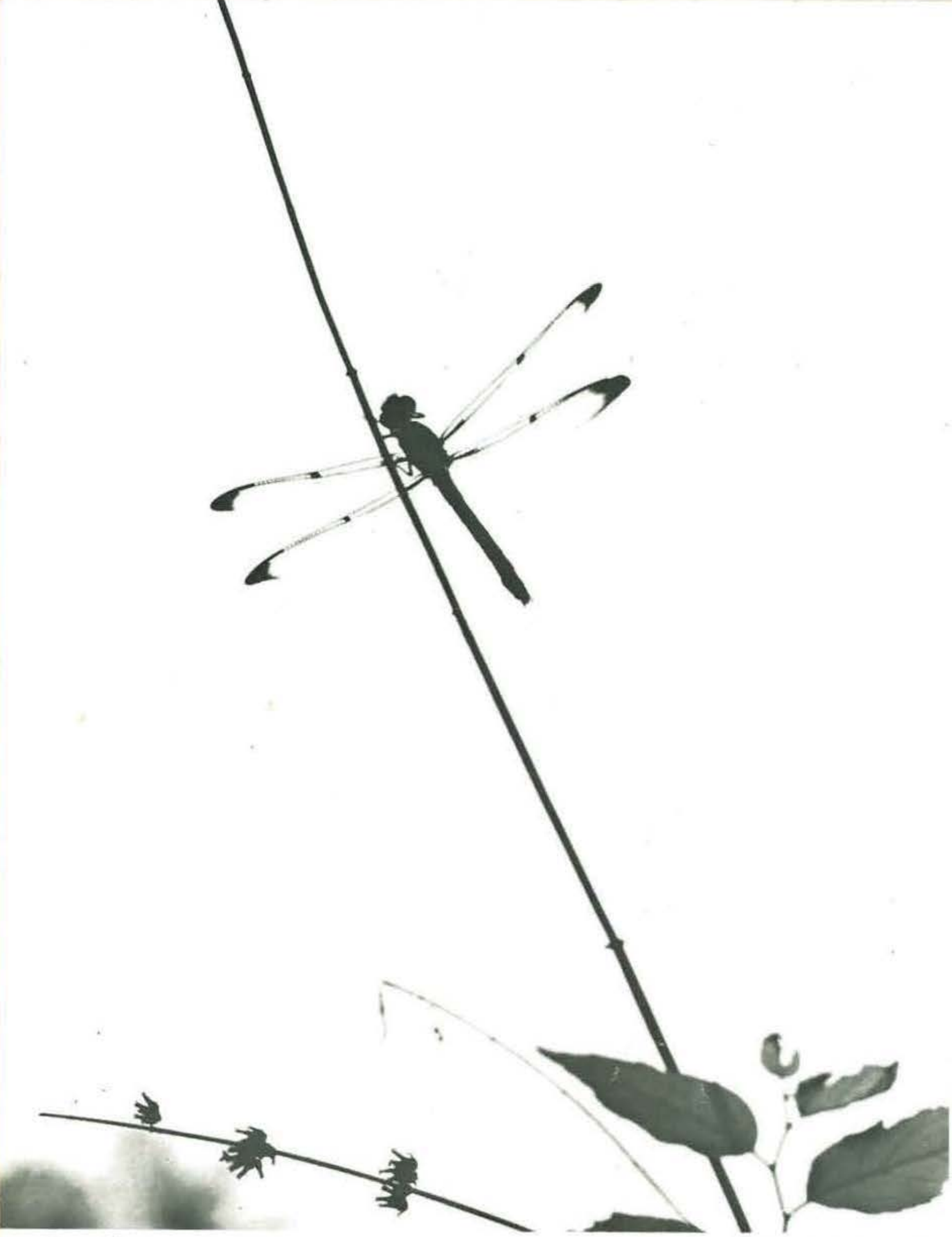

Dragonfly

Photo By Wallace Hughes

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JOSEPH F. BARNDT
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